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HEARING

BEFORE THE

PERMANENT SUBCOMMITTEE ON INVESTIGATIONS

OF THE

COMMITTEE ON GOVERNMENTAL AFFAIRS UNITED STATES SENATE

NINETY-SIXTH CONGRESS

SECOND SESSION

SEPTEMBER 22, 1980

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ENERGY SECURITY

MONDAY, SEPTEMBER 22, 1980

U.S. SENATE,
PERMANENT SUBCOMMITTEE ON INVESTIGATIONS
OF THE COMMITTEE ON GOVERNMENTAL AFFAIRS,
Washington, D.C.

The subcommittee met at 10 a.m., pursuant to notice, in room 3302, Dirksen Senate Office Building, under authority of S. Res. 361, dated March 5, 1980, Hon. Charles H. Percy presiding.

Members of the subcommittee present: Senator Charles H. Percy, Republican, Illinois; and Senator James R. Sasser, Democrat, Tennessee.

Also present: Senator Bill Bradley, Democrat, New Jersey.

Members of the staff present: W. P. Goodwin, Jr., staff director; Eleanor Hill, assistant counsel; Myra Crase, chief clerk; Joseph G. Block, chief counsel to the minority; Charles Berk, general counsel to the minority; Howard Marks, William Strauss, and Howard Shapiro, investigators to the minority; Paul Meagher, Scott Ulm, Robert Herman, and Miranda Johnson, staff assistants to the minority.

Member present at time of convening: Senator Percy.

Senator PERCY. The hearing of the Permanent Subcommittee on Investigations of the Governmental Affairs Committee will come to order.

[The letter of authority follows:]

U.S. SENATE,
COMMITTEE ON GOVERNMENTAL AFFAIRS,
SENATE PERMANENT SUBCOMMITTEE ON INVESTIGATIONS,
Washington, D.C.

Pursuant to Rule 5 of the Rules of Procedure on the Senate Permanent Subcommittee on Investigations of the Committee on Governmental Affairs, permission is hereby granted for the Chairman, or any member of the Subcommittee as designated by the Chairman, to conduct open and/or executive session without a quorum of two members for the administration of oaths and taking of testimony in connection with the Role of the Department of Energy in U.S. Energy Emergency Preparedness on Monday, September 22, 1980.

SAM NUNN,
Chairman.
CHARLES H. PERCY,
Ranking Minority Member.

OPENING STATEMENT OF SENATOR PERCY

Senator PERCY. Dr. Sawhill, I want to welcome you very cordially this morning.

I want to congratulate you for your nomination as Chairman of the Synthetic Fuels Corporation.

I do feel that we must get moving in this area. We need to start to develop our domestic energy sources much more intensively and I certainly commend President Carter for your nomination.

I can personally testify to the fact that your nomination has widespread bipartisan support. It is not a partisan matter, and it not only has support within the Republican Party and the Democratic Party, but also it has, I think, widespread support within the business community and the financial community, which I think is extraordinarily important.

I want to thank you for appearing today and giving what may be your last testimony as Deputy Secretary of DOE and what I consider to be the most troublesome energy issue of our time.

Certainly the glaring headlines this morning that Iraqi Mig fighters may have bombed as many as seven airports in Iran—an Iranian Air Force 707 was supposedly damaged in the strike in the Tehran Airport—and certainly the difficulty between two oil-producing countries once again raises the specter that something can happen to cut off the spigot, or turn the spigot tighter on our oil supplies. This country must be prepared for any eventuality.

Notwithstanding the best efforts of you and others in your Department, I have grown deeply and sadly concerned about the extreme vulnerability of the United States and our oil-importing allies to a future cutoff of oil supplies. Today's headlines about the escalating Iran-Iraq conflict suggest that the time may be very short to prepare for the next supply disruption.

We have had two fairly modest interruptions in our oil imports over the past 7 years. For a few months in 1973, the Arab oil embargo left us about 15 percent short of our previous import levels—and that embargo was accompanied by bad gas lines and a quadrupling of crude oil prices within a year.

In 1979, the Iranian revolution cut our oil imports by about 4 percent over a 6-month period. What did it do? It caused even more gas lines than the statistically more serious embargo, and it almost tripled crude oil prices within a little more than a year. What's more, those prices don't come down after the shortage is over. Here we are in a temporary oil glut, and what did OPEC do last week at its meeting in Vienna? It raised prices again, and the benchmark price is now $30. We are now paying almost 15 times as much for a barrel of imported crude as we did 7 years ago, and there is still no end in sight to OPEC price increases.

Let's suppose a full-scale war breaks out between Iran and Iraq, cutting off all oil exports from those two nations if this happens—and our news reports this morning suggest it easily could—the free world would lose almost 20 percent of its oil imports. The oil glut we have today would rapidly vanish, probably setting in motion the same events that occurred in 1973 and 1979. All indications are that we would be no better able to prevent a big OPEC price rise than we were on either previous occasion.

If history repeats itself, which it easily could, a supply disruption caused by an Iran-Iraq war could triple or quadruple the price of crude oil once again, to $100 or more per barrel.

This time, the hard truth of the energy crisis would slam home with

READEX FICHE

a vengeance: gasoline prices of $4 or $5 a gallon; home heating bills of well over $1,000 a month in some homes.

Is it unrealistic to talk about $100-a-barrel oil and $5-a-gallon gasoline? I don't think so. A little over a year ago DOE said that today's oil prices were impossible. In its second national energy plan, published in May of 1979, DOE made low, medium, and high price projections for the rest of this century. Because of last year's Iranian shortfall, the prices we are paying today have already skyrocketed past the DOE's high estimate for 1990—that's 1990, and here we are in 1980. By this time next year, we may have exceeded DOE's highest price projection for the year 2000.

Prices as high as I'm talking about could not last forever, and lower prices for alternative fuels would ultimately bring them down. But this could take years.

In the meantime, our economy could reel badly out of control, inflation could be in the high double, or even triple digit range, and there would be great pressure to use military force against whoever may be using the oil weapon against us.

I also worry about what another oil supply disruption—and $100-a-barrel crude—would do to our allies like Japan and West Germany who are far more dependent on imported oil than we are. They may have no choice but to pay what they must for what they need. Among developing nations, another round of price increases would be absolutely ruinous.

Over time, of course, we and other nations can reduce this vulnerability by building domestic oil stocks to safer levels and by reducing our need for imported oil, thereby putting a bit more slack in the world oil markets. I think we are making some progress in these areas, for which President Carter and the Department of Energy deserve some credit.

Even though we have not added one barrel to the strategic petroleum reserve for the past year and a half, we have seen our private stocks rise to record levels. Yet those private stocks do not offer the Nation any significant defense against an oil cutoff unless we can be sure that they would in fact be drawn down in time of emergency. One lesson of the last two shortages is that, if anything, stocks tend to increase during shortage as a hedge against an uncertain future.

Likewise, our oil imports are down by 20 percent over last year—in large part because you had the courage to allow domestic energy prices to rise—but this does not mean that we are any more secure. We are still importing about 6 million barrels a day, and it will take years to bring our imports down to safe levels. In the meantime, ironically, the same conservation efforts which can save us in the long run could leave us more vulnerable in the short run. Americans have already cut a lot of fat out of their energy consumption. Next time, during a crisis, there may not be much fat left to cut. This is why the next several years are especially perilous ones—and this is why I am so concerned that emergency preparedness is not now receiving the attention it should.

Dr. Sawhill, I know you share my concern, and again I urge you to ask Secretary Duncan and your successor as Deputy Secretary to give absolute top priority to developing effective international and

domestic strategies for responding to future supply disruptions and restraining the effects they could have on the price of crude oil.

I appreciate that you have just completed what you call a "preliminary staff analysis" of how coupon rationing compares with alternative ways of reducing gasoline consumption in an emergency—such as the bill that was introduced by Senator Johnston, a rebate and tax plan.

This paper raises a number of important issues, and I shall have it inserted in the Congressional Record and urge my colleagues to give it careful attention.

In my own reading of this 27-page paper, however, I found only one sentence—on page 14—that addressed what I consider to be the heart of the matter:

"If world oil prices rise rapidly at the outset of an interruption, plans that are difficult and time-consuming to implement may be less useful."

I would use the word "worthless" to describe cumbersome plans—like rationing—that are no defense whatsoever against skyrocketing crude prices. By the time you have printed and distributed all those coupons, pump prices could be so high that the number of motorists who could afford to buy gas with or without a coupon would have been substantially reduced.

I persist in my strong belief that your gasoline rationing plan is the Maginot Line of emergency planning; it has already consumed most of DOE's efforts on emergency preparedness over the past 3 years, and DOE is now proposing to expand those efforts and spend another $103 million on the plan. Except for this—and the resumption of oil purchases for the strategic petroleum reserve, which I support—DOE has no major initiatives planned, that I know of. I am especially concerned by reports that many of your contingency plans, like the rationing plan, would require months to be implemented. In my view, the first 90 days could be the most perilous phase of a severe supply disruption, as that would be when oil prices might leap, and when the pressures for military action might be greatest. This is why I asked you to address your testimony to this time period in particular.

There is much that we could do, even within the first 90 days of a disruption, and I suspect that whoever is President would want to act quickly and decisively. If we lay the groundwork today, for example, the President could respond to a shortage by immediately asking the Congress for the authority and funds needed to conduct a massive program to weatherize homes, make maximum use of existing energy resources, and develop new domestic energy resources at an unprecedented rate. But must we wait until the crisis comes to start improving our preparedness in this way? In energy policy as in the military the best way to keep crisis from our door is to look and act as though we are ready to respond—and the national interest demands that we be ready to respond, if need be. We tempt fate if we wait until the crisis comes to start asking what can be done.

I want to thank you very much indeed for being with us, Dr. Sawhill, this morning. We look forward to your testimony. Though the Permanent Subcommittee's charter in the area of energy is very, very clear and we have conducted a number of studies and investigations, I would like you to know that we have worked very closely with the

energy committee, with their staff and have invited, and they may drop by later this morning, some of our colleagues on the energy committee that have a particular interest in this field.

I have just been handed a note that Senator Bradley will be with us very shortly. We look forward to your testimony and I thank you very much.

Mr. SAWHILL. Thank you very much, Mr. Chairman. I appreciate the chance to be with you.

Senator PERCY. I am awfully sorry, I forgot that, as you well know, the rules are that all witnesses before the Permanent Subcommittee on Investigations be sworn in.

Do you solemnly swear to tell the truth, the whole truth, and nothing but the truth, so help you God?

Mr. SAWHILL. I do.

TESTIMONY OF JOHN C. SAWHILL, DEPUTY SECRETARY, DEPARTMENT OF ENERGY

Mr. SAWHILL. I am very pleased to be before you today. I appreciate your remarks at the outset of your statement about my nomination.

This topic that we are discussing today obviously is a very important one. It is receiving the highest level attention within the Department of Energy and other Federal agencies and I would commend the committee for its efforts and continuing interest in the state of U.S. preparedness to cope with an oil import disruption.

It is all too easy to take for granted the routine daily operation of the world oil market and forget the vulnerable position of the oil-importing countries. Indeed, the current situation is quite positive. Imports are down about 20 percent from last year, markets are relatively soft, drilling for oil and gas in the United States is at a 25-year high and U.S. oil stocks are at record levels.

We should take encouragement from these indicators; they reflect, in part, that U.S. energy policy is on the right track. However, the outlook at least for the next decade is different and warrants intensive planning and preparation by the United States and its allies. With an economic upturn in the industrialized countries and possible production limitations within OPEC, we could again experience a tight market and sharp price increases. Furthermore, the market today is in fragile balance; sudden and protracted supply disruptions could occur for any of the several reasons.

DOE's current projections indicate that the United States will continue to be heavily dependent on imported oil for the next decade. Although our economy will become much more efficient in its use of all forms of energy, the projected decline in domestic oil and natural gas production in this decade will keep oil imports from dropping significantly. In the longer term—after 1990—alternative sources spurred by today's R. & D. and capital investments may provide for substantially reduced dependence on foreign oil. However, in the near-term, our dependence is inevitable. Further, our allies are even more dependent than we are on imported oil, and most of them do not have the domestic resources that would allow an assured transition off of imported oil.

At this time, dependence on imported oil implies vulnerability of two types: (1) vulnerability to the exercise of market power by oil-exporting countries and (2) vulnerability of the world oil market to a sudden loss in supply from the major oil-exporting countries. Both types of vulnerability arise because of the concentration of most of the low-cost oil supplies in a historically unstable region and the inability of industrialized economies to adjust quickly and efficiently to changes in oil prices.

The world's oil supply and logistical systems are highly complex and extensive. It is worth keeping in mind that at critical points, they become highly concentrated and subject to disruption from any number of causes:

The world's largest oil field, Ghawar in Saudi Arabia, accounts by itself for some 10 percent of free world oil production;

The Strait of Hormuz at the mouth of the Persian Gulf is the transit point for about 60 percent of OPEC production; 73 percent of the supply in Japan, 56 percent of Europe, and 16 percent of supply to the United States; and tanker traffic around South Africa's Cape of Good Hope accounts for about half of Europe's oil supply, and more than 10 percent of our own.

Last February I had the opportunity to testify before the Foreign Relations Committee on world energy developments. The crucial role of Persian Gulf production accounts for 31 percent of our imports. Western Europe and Japan are even more dependent, however, at levels of 63 and 70 percent respectively. At these high levels of dependence upon a commodity with the strategic importance of oil, our allies cannot take lightly any significant disruption in their supplies or even the prospect of a disruption. It is, therefore, vitally important that we work cooperatively with them, drawing upon our shared political objectives and our common interests as oil consumers.

The alternative to international cooperation would be disjointed, unilateral actions, which—as we witnessed in 1979—would only serve to drive prices up sharply; moreover, the political consequences on this kind of scenario could prove damaging to our broad interests in Western solidarity and cooperation among industrialized countries.

As I have indicated, our dependence on foreign oil is likely to continue and, to a certain extent, is inevitable. However, this does not imply that we must remain vulnerable. The United States and its allies can take a variety of actions, independently and collectively, to reduce our vulnerability—both by reducing our imports and by taking steps such as stockpiling oil and developing contingency plans that will lower the social and economic costs of a disruption, if one occurs.

Let me now turn to the contingency planning and crisis management organization within the executive branch.

I have outlined extensively in my testimony, and I believe you have a copy, the kind of organization that we have in place. Rather than review that in detail here, I hope that testimony will be inserted in the record.

Senator PERCY. Any portions that you would like to summarize, Dr. Sawhill, your entire statement will be incorporated in the record. But I have gone through it very carefully.

[The statement follows:]

STATEMENT OF JOHN C. SAWHILL, DEPUTY SECRETARY, DEPARTMENT OF ENERGY

INTRODUCTION

Mr. Chairman, members of the Committee, I am pleased to be with you today to discuss a topic that is of great importance to our country, reducing U.S. vulnerability to potential disruptions in the flow of imported oil. This topic merits—and I believe is receiving—the highest level attention from DOE and other Federal agencies. This Committee is to be commended for its continuing interest in the state of U.S. preparedness to cope with an oil import disruption.

It is all too easy to take for granted the routine daily operation of the world oil market and forget the vulnerable position of the oil-importing countries. Indeed, the current situation is quite positive: imports are down about 20 percent from last year, markets are relatively soft, drilling for oil and gas in the U.S. is at a 25-year high, and U.S. oil stocks are at record levels. We should take encouragement from these indicators; they reflect, in part, that U.S. energy policy is on the right track. However, the outlook at least for the next decade is different and warrants intensive planning and preparation by the U.S. and its allies. With an economic upturn in the industrialized countries and possible production limitations within OPEC, we could again experience a tight market and sharp price increases. Furthermore, the market today is in fragile balance; sudden and protracted supply disruptions could occur for any of several reasons.

DOE's current projections indicate that the U.S. will continue to be heavily dependent on imported oil for the next decade. Although our economy will become more efficient in its use of all forms of energy, the projected decline in domestic oil and natural gas production in this decade will keep oil imports from dropping significantly. In the longer term—after 1990—alternative sources spurred by today's R&D and capital investments, resulting from policies and programs developed by the Administration and the Congress, should provide for substantially reduced dependence on foreign oil. However, in the near-term, our dependence is inevitable. Further, our allies are even more dependent than we are on imported oil, and most of them do not have the domestic resources that would allow an assured transition away from imported oil.

At this time, dependence on imported oil implies vulnerability of two types: (1) vulnerability to the exercise of market power by oil-exporting countries, and hence higher prices than would otherwise prevail; and (2) vulnerability of the world oil market to a sudden loss in supply from the major oil-exporting countries. Both types of vulnerability arise because of the concentration of most of the world's oil in a historically unstable region and the inability of industrialized economies to adjust quickly and efficiently to changes in oil prices.

The world's oil supply and logistical systems are highly complex and extensive. It is worth keeping in mind that at critical points, they become highly concentrated and subject to disruption from any number of causes:

The world's largest oil field, Ghawar in Saudi Arabia, accounts by itself for some 10 percent of Free World oil production;

The Strait of Hormuz at the mouth of the Persian Gulf is the transit point for about 60 percent of OPEC production; this oil accounts for about three-quarters of Japan's oil supplies, about half of Europe's oil supplies, and one-sixth of U.S. oil supplies;

Tanker traffic around South's Africa's Cape of Good Hope accounts for about half of Europe's oil supply, and more than 10 percent of our own.

Last February, I had the opportunity to testify before the Foreign Relations Committee on world energy developments. One of the critical points I made was the importance of Persian Gulf production to the industrialized countries. I also indicated that we could expect very little change in the dependence of the industralized countries on the Persian Gulf in the near term.

At these high levels of dependence upon a commodity with the strategic importance of oil, our allies cannot take lightly any significant disruption in their supplies, or even the prospect of a disruption. It is therefore vitally important that we work cooperatively with them, drawing upon our shared political objectives and our common interests as oil consumers. The alternative to international cooperation would be disjointed, unilateral actions, which—as we witnessed in 1979—would only serve to drive prices up sharply; moreover, the political consequences on this kind of scenario could prove damaging to our broad interests in Western solidarity and cooperation among industralized countries.

As I have indicated our dependence on foreign oil, is likely to continue and, to a certain extent, is inevitable. However, this does not imply that we must remain vulnerable. The U.S. and its allies can take a variety of actions, independently and collectively, to reduce our vulnerability—both by reducing our imports and by taking steps such as stockpiling oil and developing contingency plans that will likely lower the social and economic costs of a disruption, if one occurs.

CONTINGENCY PLANNING AND CRISIS MANAGEMENT ORGANIZATION

Let me now turn to the energy contingency planning and crisis management organization within the Executive Branch. The Secretary of Energy is the President's Energy Crisis Manager for the Federal Government, serving as chairman of the Energy Coordinating Committee (ECC). The ECC is the Cabinet-level body which coordinates policy formulation and decisionmaking for energy matters. The ECC membership is established by Executive Orders 12083 and 12148 and includes virtually all the Cabinet Officers and key Presidential Assistants.

During an energy interruption, the ECC is charged with formulating and coordinating an integrated Federal, state, and public sector response. Specifically, the ECC will review the assessments of the domestic and international energy situation and develop a Cabinet level recommendation for the President as to the appropriate course of action. The recommendation will contain a set of objectives to be achieved during the emergency and response actions to be implemented by the Government. Once Presidential approval has been obtained the ECC will coordinate implementation through each executive agency.

To provide a centralized focus for the development of contingency plans within the Department, the Secretary has established the Office of Energy Contingency Planning in the Economic Regulatory Administration reporting directly to the Secretary. This office will function as the core staff for the preparation of contingency response plans. In recognition of the importance of this function and its significance to the Secretary and myself, either Secretary Duncan or I meet with the head of the Contingency Planning Office weekly to provide necessary policy guidance and review progress. The DOE program offices that have operational responsibility for the various measures included in the contingency plan are contributing to the planning process; the program offices also will be responsible for program operation during the disruption. The response plans being developed will define specific steps to be taken to implement emergency measures and will provide for coordination among Federal, State and local governments, private industry and individual consumers.

In addition, the Economic Regulatory Administration has established a special office, the Energy Liaison Center (ELC), within the Office of the Administrator of ERA to enhance the capability of the Department of Energy to communicate effectively with state and local governments in the event of short-term energy emergencies.

The ELC serves as the primary point of contact between state energy offices and DOE program offices, including the Office of Petroleum Operations and the Office of Contingency Planning, in ensuring the expeditious processing of requests to the Department for information and assistance. As a liaison office, the ELC also fosters an intergovernmental approach to short-term energy shortages through measures such as the "Energy Emergency Handbook," which is designed to provide Federal, State, and local officials concerned with emergency management with practical, timely and accurate information for use during energy emergencies. This handbook contains directories of key Federal and State officials involved with emergency management as well as summaries of Federal and state response measures which may be utilized to mitigate short-time energy emergencies.

Another important agency with both crisis management and contingency planning responsibilities is the Federal Emergency Management Agency (FEMA). This agency has overall government responsibility to assist states, local governments and citizens in planning for civil defense preparedness, severe weather-related emergencies, nuclear disasters, and fire hazards. In order to carry out its planning responsibilities in these areas, FEMA has a national and regional organization of facilities, people and programs which also can respond during energy emergencies, especially at the state and local government levels.

A working relationship has been developed between FEMA and DOE under which FEMA will assist the Secretary of Energy, acting as Crisis Manager, in performing a variety of support functions during an energy emergency to assure

effective coordination and implementation of decisions at both the Federal and state level. For example, the Secretary could call upon FEMA's reporting, data gathering, and communications capabilities to obtain information regarding the impacts of petroleum shortages that will be critical to effective crisis management. Thus, FEMA could assess the severity of gasoline lines; further, if a heating oil shortage is imminent, FEMA could monitor local conditions, such as weather, shelter needs, and homeowner fuel supplies; and during the shortage, it can assist local governments in providing shelter. With its extensive field organization, FEMA also will be able to assist DOE in coordinating Federal agency regional office activities and, where necessary, in identifying issues for resolution by the Crisis Manager. FEMA also could be called upon to hold regular meetings with local government officials regarding local and regional problems, and to report its findings to the crisis manager. Finally, FEMA can provide training for Federal and state government personnel in crisis management.

In summary, Mr. Chairman, the framework of the Federal government management structure for planning and coordinating an effective response to energy emergencies is in place today. We are working actively on further development of this structure.

PETROLEUM DATA GATHERING

Before discussing the specific measures that could be used in a disruption, I would like to address a critical element in our emergency preparedness planning, our petroleum data gathering and monitoring capability.

The Department has developed a broad and far reaching program of data collection, processing, and dissemination to discharge its petroleum industry regulatory and emergency preparedness responsibilities. Our present data gathering system consists of both national and international collection components and exemplifies our continuing attempt to produce accurate and timely information while not creating an unmanageable administrative burden on private industry.

The present systems allow the tracking of the crude oil flow from the source through the refinery and the distribution chain at the prime supplier level on a monthly and, in some cases, weekly basis. These data systems allow the constant monitoring of crude oil stocks, refinery production, and inventory levels by prime supplier aggregated by region and state. These systems will provide the necessary information and data base to formulate recommendations prior to and during an emergency to effectively manage our response actions. The weekly reporting component, introduced in April 1979, now contains information based entirely on government-collected data, without dependence on information from industry trade associations.

In 1979, the Energy Information Administration (EIA) initiated a program to obtain secondary stocks information on fuel oil stocks, quantities sold, and stock-sales ratios at the wholesale and retail levels. This program, conducted in cooperation with the U.S. Bureau of Census, provides an indication of sales and use patterns below the prime supplier level. A quarterly survey of residential consumption has also been developed and implemented, to allow a greater understanding of energy uses and the relationships between disappearance of supplies from the primary level and their consumption in the residential sector.

The EIA has initiated cooperative agreements with thirteen New England and upper Midwest States, under which the States will provide current heating oil prices to enable EIA to maintain up-to-date monitoring of heating oil price performance during the forthcoming heating season. Additionally, many of these States will be monitoring available heating oil supplies in their States and will be able to provide immediate information relating to product supply.

Two recent innovations in inventory data gathering have been developed by DOE. A monthly report which reflects prime suppliers three-month projections of crude oil and refined product stocks on an equity basis was initiated during 1979. The prime supplier three-month projection of total supplies and stocks (EIA–169) is collected irrespective of where those products are located in the flow. The Crude Oil Ownership Reporting System (EIA–456), which collects monthly equity-based data reflecting crude oil loadings, volumes in transit, and landings, was initiated in September of this year. The data are collected, again, irrespective of crude location in the flow. Information from both these systems would be used to assist the Department in monitoring industry stocks which might be required during an interruption to sustain the flow of product to the marketplace.

The Energy Emergency Management Information System (EEMIS) is currently being developed by the Energy Information Administration to establish a system to assemble and communicate information needed by decisionmakers at the Federal, regional, and state levels during an energy emergency. A pilot system became operational in March 1980, and includes the following components which can be used during energy emergency situations:

An integrated data base which offers users quick access to existing EIA oil and gas information;

A microfiche file which provide for access and maintenance of relevant reports, contingency plans, regulations, emergency directives, and maps;

A file of knowledgeable individuals to contact for information in an emergency; and

A status reporting and monitoring system using a computer-based message system integrated into EEMIS.

In addition, a stand-alone communications system is being developed to provide immediate information exchange among users of the system, principally State energy offices. At this time, 25 states are participating; plans call for expansion to all 50 states by the end of CY 1980.

Beyond the work we are doing to get data on our domestic supplies, we are also participating in the IEA's data gathering system; this provides us with company-specific information on monthly crude oil shipments to U.S. by exporting country; in addition, shipments expected over a subsequent two-month period are also projected, and thus provide a basis for forward estimates of oil-in-transit. Members of the Subcommittee staff have been briefed on the upcoming IEA allocation system simulation exercise and are knowledgeable of its objectives and program test plans. This test will improve our preparedness to function during an emergency.

EMERGENCY RESPONSE MEASURES

In the event of an oil supply disruption, three categories of actions are available to lower the cost of the disruption: actions to increase oil supplies and thus limit the shortfall; actions to reduce the demand for oil, oil products, and oil substitutes; and actions to manage remaining supplies of oil and substitutable energy sources. I will discuss measures in each of these categories.

The most important thing we can do to reduce our vulnerability is to have an adequate stockpile to increase oil supplies and thus limit the shortfall in a disruption. The current oil stocks in the U.S. and other industrialized nations provide an important buffer that could cushion the harmful effects of a disruption.

In the past several months the supply situation in the United States for crude oil, gasoline and several other petroleum products has improved significantly over what it was during the corresponding period of 1979. At the end of August 1980, crude oil stocks stood at 393 million barrels, a 22 percent increase over last year's level. Gasoline stocks at the primary level were about 259 million barrels, up 27 million barrels or about 12 percent over August 1979 levels. Distillate stocks were at 223.2 million barrels or 30 million barrels above last year's level. Aggregate primary stocks of crude oil and petroleum products were 1,351 million barrels—near record high levels—and 164 million barrels, or 13 percent, above last year's level. These stock levels are not only high in absolute terms, but are particularly high considering the fact that total petroleum consumption for the four weeks ending August 29, 1980, had declined about 12 percent as compared to the corresponding period of a year ago and imports for the first 8 months of 1980 have decreased by about 20 percent from the same period in 1979.

Consider the value of these stocks during a supply disruption. During the Arab embargo of 1973–74 that lasted more than 4 months, U.S. oil supplies were reduced by an average of slightly less than 1 million barrels per day. Right now, U.S. primary stocks are 164 million barrels higher than they were in 1978. Thus, the current stocks could entirely offset a disruption of the size and length of the 1973 embargo and still provide approximately 40 additional days of protection against a further disruption of that magnitude.

In order to continue to provide this degree of protection, we are examining options to maintain, and perhaps increase, the private stocks of crude oil and petroleum products being held. This could be accomplished by a variety of mechanisms, including providing financial incentives to build and maintain high stock levels. The semi-private oil storage corporation established by West Germany provides an interesting example of public support of private sector stockpiling. We are also examining the potential for a reserve of natural gas, which could be

used to displace oil as a boiler fuel during a disruption, freeing up oil for conversion to transportation fuels. I should emphasize that these are items under study, and no decisions have been made concerning any of them.

A second measure is to drawdown the Strategic Petroleum Reserve inventory. SPR drawdown tests have been completed and have demonstrated the ability to draw at a rate of 1 million barrels per day from the three SPR sites that currently have crude oil in storage.

Increasing the size of the SPR would be of great benefit in further reducing our vulnerability. The approximately 91 million barrels currently in the SPR represents only 37 percent of existing SPR capacity. Capacity is planned to be increased from the current 248 million barrels to about 400 million barrels in 1984 and more than 500 million barrels in 1986. The Administration is resuming SPR fill using oil from the Naval Petroleum Reserve. Oil is now en route to the salt domes in Louisiana and Texas by pipeline from Elk Hills. We are also considering options for increasing the average fill rate above the 100 thousand barrels per day level, by using the production from Elk Hills.

A third supply enhancement possibility could be to temporarily increase the Naval Petroleum Reserve production by approximately 20 thousand barrels per day.

The second category of emergency response actions involves demand restraint. Of course, world oil prices will automatically rise during a disruption. Higher prices have proven to be the most effective brake on oil demand. Higher prices can result in windfalls to producers and marketers; the government revenues collected through the Windfall Profit Tax and other taxes could have adverse economic effects unless they are effectively rebated.

There are also a variety of non-price measures that can reduce the demand for oil. For example, motor fuel consumption could be reduced by encouraging states to strictly enforce the 55 mph speed limits. Similarly, the emergency building temperature restrictions could be extended. The emergency conservation measures authorized by Title II of the Emergency Energy Conservation Act of 1979, including mandatory state fuel consumption targets, would also be employed.

One of the steps we have taken is to prepare a gasoline rationing plan, which has been approved by Congress. We stand ready to preimplement the gasoline rationing plan as soon as Congress has had the opportunity to appropriate funds. The preimplementation steps would insure that the plan is ready if needed. During the past few months, the Department has initiated a number of important activities. These include:

Selection of an integration contractor;

Drafted state agreements for the state role in rationing;

Developed a draft interagency agreement with the Bureau of Engraving and Printing for coupon production;

Initiated detailed functional description for each component of the system; and

Surveyed state motor vehicle registration agencies to determine state capacities and needs.

We are also analyzing other ways to use the market mechanism during a disruption, including:

An alternative to the coupon rationing plan by which an emergency excise tax would be imposed on gasoline, with the proceeds rebated to individuals;

A disruption tariff to limit transfer of national income to foreign producers during a disruption. Such a restraint measure, if also imposed by our allies, might reduce increases in world oil prices. During a crisis tariff revenues could be rebated back to the economy to maintain consumer purchasing power and limit damage to the economy.

A preliminary report by DOE and Treasury staff analyzing several alternative mechanisms for allocating reduced supplies of oil during a disruption has recently been transmitted to Congress. Work on this subject is continuing with the high level attention it deserves from several agencies.

The third category of emergency response action is fuel management. Such actions include both oil-to-gas switching in the industrial and electric utility sectors and electricity transfers to use as much non-petroleum-generated electricity as possible. To this end, representatives of the Electric Power Research Institute, the National Electric Reliability Council, the Edison Electric Institute, the National Rural Electric Cooperative Association, and the American Public Power Administration are assisting us in our fuel management planning.

Other fuel management options are ready for implementation if needed. They include minimum purchase requirements at gasoline stations, emergency prices and allocation controls on crude oil and petroleum products, and state set-asides of up to five percent of the volume of oil supplied to each state for distribution in emergencies and in hardship situations.

The Contingency Planning Office has done considerable work on the options I have summarized and would be glad to provide further information if the Committee is interested.

U.S. POLICY IN INTERNATIONAL CONTEXT

While the U.S. dependence on imported oil and vulnerability to oil supply disruptions prompts us to take the measures I have described, we must also be aware that several of our allies depend on imported oil for a much larger proportion of their oil supplies than the U.S. Therefore, it is important that we take coordinated measures to reduce our collective dependence on foreign oil.

At the June Economic Summit in Venice, participants agreed on a comprehensive strategy to reduce significantly oil's share in their energy consumption over the decade and to reduce the ratio of energy growth to economic growth. As a result of these decisions as well as parallel actions in the International Energy Agency, the industrialized countries are now better positioned to deal with the long-term oil supply problem. As important as these dependence-reducing actions are, however, they are insufficient to reduce vulnerability unless supported by effective means to deal with specific short-term supply disruptions.

Our programs to deal with disruptions in the international oil market stem from our experience during the OPEC selective embargo of the United States and the Netherlands in 1973 as well as the Iranian situation in 1979.

We have joined with twenty other industrialized countries in the International Energy Agency in developing an effective emergency oil sharing mechanism. This system has two important functions. First, it is designed to assure each participating nation that it would not be isolated from oil supplies in any attempt at a targeted embargo. Second, in the event of a sudden reduction in world oil production, the system provides a means for all countries to share in the supply difficulty. The IEA's emergency sharing system is normally tested every few years; as I indicated earlier, the third exercise will take place in October and November of this year. The exercises provide an important opportunity to train personnel in the operation of the system and to adapt the system to changes in the oil market.

As a result of an initiative by the U.S. and several other member countries, the IEA at its Ministerial meeting in May put in place a system of yardsticks and ceilings to be used both to measure progress in achieving our mid-term oil import objectives and to allow IEA countries to deal at short notice with a deterioration in the oil market that falls short of the 7 percent threshold disruption, required to trigger the formal IEA sharing mechanism. As agreed, each country's estimated oil imports or yardsticks for the year will be developed. If tight market conditions appear imminent, IEA Ministers will meet and decide to take action such as transforming these yardsticks into individual country oil import ceilings and taking demand restraint or supply enhancement measures in order to prevent a scramble for oil. We believe that this additional mechanism provides an important political commitment by the IEA members to carry forward the decisions taken at the IEA's December 1979 Ministers meeting, which established individual 1980 oil import ceilings and 1985 objectives, to deal effectively with the changed market situation of the 1980's.

Through the IEA, we are reviewing carefully the potential for action by the 21 member countries to coordinate policies on commercial and strategic inventories. One of the fundamental lessons from the market disruption following the Iranian Revolution is that if consuming nations try to outbid one another during a period of market tension in an irresponsible scramble to accumulate inventories, they will only succeed in bidding up the prices, with no appreciable benefit in their supply position. Coordinated measures of restraint and carefully timed drawdown during periods of disruption could be, in conjunction with the other contingency planning actions I have described, an effective way of limiting price explosions of the kind we have recently experienced.

CONCLUSION

Mr. Chairman, in concluding this statement I want to emphasize again that we have made very important progress in dealing with our energy problem—imports are down, consumption of oil is down, drilling is up, stocks of oil are up, and

alternative energy sources are being actively pursued. However, as this Committee well knows, the vulnerability of the United States and our allies to oil supply disruptions remains high, and is likely to be so for the foreseeable future. Improved preparedness to cope with such disruptions, if they occur, is a major activity of DOE and other Federal agencies.

I have outlined our organizational structure for dealing with this critically important topic and the major steps we have taken and those we are pursuing to become better prepared. Much remains to be done. We look forward to working closely with the Congress as we continue our efforts in this area.

Mr. Chairman, this concludes my statement. I would be happy to respond to any questions you might have.

Mr. SAWHILL. Thank you very much.

[At this point Senator Sasser entered the hearing room.]

Mr. SAWHILL. We have the Energy Coordinating Committee that is chaired by the Secretary of Energy. That Coordinating Committee consists of most of the major agencies of the Government.

The Secretary of Energy as chairman of that committee has overall responsibility for managing supply disruption and for establishing policies that would deal with a supply disruption.

I also outline in there the organization within the Department of Energy which we have put in place to deal with supply disruptions. We have organized a special office headed up by Bart House, who is here with me today, reporting directly to the Secretary. Either the Secretary or myself meet on a weekly basis with Mr. House to review his progress and to discuss the status of our contingency planning efforts.

We have also established an Energy Liaison Center within the Economic Regulatory Administration to communicate effectively with State and local governments. We have published an Energy Emergency Handbook to advise people of the organization that we have in place.

We are working closely with the Federal Emergency Management Agency, FEMA, and I describe in my testimony the nature of that relationship.

So I think the framework of the Federal Government management structure for planning and coordinating and effective response is in place today. We are looking forward to working to further develop this structure.

The next portion of my testimony deals with the specific measures that we have undertaken to improve our data-gathering capability to handle an energy emergency.

I outline in that portion of the testimony the number of systems we have in place; the materials we have gathered, for example, we are now collecting data on secondary stocks, on fuel oil, and on other products, so that we will be in a better position in the future to handle any disruption, should one occur.

Senator PERCY. Dr. Sawhill, I did not notice in that section any reference to the previous practice of relying upon the industry for data. Has that reliance now been lessened? Are you more independent? Have you had enough experience to determine whether your figures are getting increasingly accurate and are adequate now for your control purposes?

Mr. SAWHILL. At the top of page 9, I indicate that the weekly reporting component of our system introduced in April 1979, now contains information based entirely on Government-collected data, without dependence on information from industry trade associations. I

do have here with me today the Acting Director of the Energy Information Agency, Al Linden, and he will be happy to respond to any questions you might have about the accuracy of our data.

I do believe, from my own review of it, that our systems have improved substantially and that we are making good progress in this area.

I might also call your attention to the discussion in my statement of the energy emergency management information system, which is currently being put into place. This is a very extensive system which is specifically designed to enable us to manage an emergency more effectively. It consists of an integrated data base which offers users quick access to all IEA oil and gas information; a microfiche file which provides for access and maintenance of relevant reports, contingency plans, regulations, emergency directives and maps; a file of knowledgeable individuals to contact for information in an emergency; and a status reporting and monitoring system using the computer-based message system which is integrated into this EEMIS. So I believe we have made good progress in that regard.

I might say that beyond the work we are doing to get data on our domestic energy supplies, we are also participating in the IEA—International Energy Agency—data gathering system. This provides us with company-specific information on monthly crude oil shipments to the United States by exporting country. In addition, shipments expected over a subsequent 2-month period are also projected and thus provide a basis for forward estimates of oil in transit. Members of the subcommittee staff have been briefed on the upcoming IEA allocation system simulation exercise and are knowledgeable of its objectives and program test plans. This test will further improve our preparedness to function during an emergency.

Senator PERCY. I would like to indicate from every evidence we have the data systems are considerably better now than they were before, and we certainly congratulate Al Linden on that.

Mr. SAWHILL. I thank you. He and his associates should be commended for the work that they have done.

I would now like to turn, having discussed organization, and our data systems, which I think you will agree have been significantly improved, I would like to discuss some specific emergency response measures and how we would go about handling the supply disruption. In the event of an oil supply disruption, there are three categories of actions that are available to lower the cost of the disruption. First, actions to increase oil supplies and thus limit the shortfall. Second, actions to reduce the demand for oil, oil products, and oil substitutes. And third, actions to manage the remaining supplies of oil and substitutable energy sources. And I would like to discuss each of these.

The most important thing we can do to reduce our vulnerability is to have an adequate stockpile so that we would be in a position to increase oil supplies in the event of a disruption and thus limit the shortfall should a disruption occur. The current oil stocks in the United States and other industrialized nations provide an important buffer that could cushion the harmful effects of a disruption.

In the past several months, the supply situation in the United States for crude oil, gasoline and several other petroleum products has improved significantly over what it was during the corresponding period

of 1979. At the end of August 1980, crude oil stocks stood at 393 million barrels, a 22-percent increase over August 1979 levels. Distillate stocks were at 223.2 million barrels or 30 million barrels above last year's level. Aggregrate primary stocks of crude oil and petroleum products were——

Mr. CHAYES. Billion.

Mr. SAWHILL. Yes; you are right, 1,351 billion barrels—near record high levels—and 164 million barrels, or 13 percent, above last year's level. These stock levels are not only high in absolute terms, but are particularly high considering the fact that total petroleum consumption for the 4 weeks ending August 29, 1980, had declined about 12 percent as compared to the corresponding period of a year ago and imports for the first 8 months of 1980 have decreased by about 20 percent from the same period in 1979.

Consider the value of these stocks during a supply disruption. During the Arab embargo of 1973–74, which, as you recall, I was deeply involved in at that time, lasted over 4 months. U.S. oil supplies were reduced by an average of slightly less than 1 million barrels per day.

Right now, U.S. primary stocks, as I earlier indicated, are 164 million barrels higher than they were in 1978. Thus the current stocks could entirely offset a disruption of the size and length of the 1973 embargo and still provide approximately 40 additional days of protection against a further disruption of that magnitude.

In order to continue to provide this degree of protection, we are examining options to maintain, and perhaps increase, the private stocks of crude oil and petroleum products being held. This could be accomplished by a variety of mechanisms, including providing financial incentives to build and maintain high stock levels. The semiprivate oil storage corporation established by West Germany provides an interesting example of public support of private sector stockpiling.

We are also examining the potential for a reserve of natural gas, which could be used to displace oil as a boiler fuel during a disruption, thus freeing up oil for conversion to transportation fuels.

A second measure we could take, other than the private stocks and their measurement, is to draw down the strategic petroleum reserve inventory. SPR drawdown tests have been completed and have demonstrated the ability to draw at a rate of 1 million barrels per day from the three SPR sites that currently have crude oil in storage.

Increasing the size of the SPR would be of great benefit in further reducing our vulnerability. The approximately 91 million barrels currently in the SPR represents only 37 percent of existing SPR capacity. Capacity is planned to be increased from the current 248 million barrels to about 400 million barrels in 1984 and more than 500 million barrels in 1986. The administration is resuming SPR fill using oil from the naval petroleum reserve. Oil is now en route to the salt domes in Louisiana and Texas by pipeline from Elk Hills. We are also considering options for increasing the average fill rate above the 100,000 barrels per day level, by using the production from Elk Hills.

I do have here with me Mr. Abe Chayes, who is a special adviser to Secretary Duncan on the strategic petroleum reserve and will be available to answer any questions that you might have about that policy and that operation.

A third supply enhancement possibility could be to temporarily increase the naval petroleum reserve production, and we believe this could be done by approximately 20,000 barrels a day.

Let me then turn to the second category of emergency response actions which involves demand restraint. Of course, world oil prices will automatically rise during the disruption. Higher prices have proven to be the most effective brake on oil demand. Higher prices can also result in windfalls to producers and marketers. Now, in part, this would be offset by Government revenues which would be collected by the windfall profits tax, which was enacted by the Congress last spring. Other taxes, if there were other taxes, could have adverse economic effects unless they were effectively rebated. That is why I think it is important in advance of an emergency to develop a rebate system. And as you know, we have submitted some material to you on the work we are doing on the rebate system. It is clear that further work needs to go forward in this regard.

Now beyond the price mechanism, and I want to again underscore for you that I think the price mechanism is the most appropriate measure to take for demand restraint, coupled with some type of tax and rebate system so the money can be recycled back into the economy. But beyond the price mechanism, there are also a variety of nonprice measures that could reduce the demand for oil.

For example, motor fuel consumption could be reduced by encouraging States to strictly enforce the 55 miles per hour speed limits. Similarly, the emergency building temperature restrictions could be extended. The emergency conservation measures authorized by title II of the Emergency Energy Conservation Act of 1979, including mandatory State fuel consumption targets, could be employed.

One of the steps we have taken is to prepare a gasoline rationing plan, which has been approved by Congress. As you know, Congress gave us authority to go forward with the gasoline rationing plan. We submitted the plan to the Congress and it was reviewed and approved by the Congress. Now we are taking steps to make sure if needed we are prepared to implement it.

I outline some of those steps in my testimony.

Again, though, I would get back to the market mechanism and indicate to you that we are analyzing other ways to use market mechanisms during the disruption, including reviewing, as an alternative to the coupon rationing plan, a plan by which an emergency excise tax could be imposed on gasoline, with the proceeds rebated to individuals.

We are also reviewing a disruption tariff to limit transfer of national income to foreign producers during a disruption. Such a restraint measure, if also imposed by our allies, might reduce increases in world oil prices. During a crisis tariff revenues could be rebated back to the economy to maintain consumer purchasing power and limit damage to the economy.

Senator PERCY. It is quite apparent that Governor Reagan last night did not think very highly of the recycling plan.

Mr. SAWHILL. Yes, sir.

Senator PERCY. In your judgment, as I think you have testified in other parts of your statement, is the price of gasoline market sensitive

enough so that you could put a high enough excise tax to affect consumption and then recycle it to reduce hardship?

Mr. SAWHILL. Yes. It seems to me that this would be an appropriate mechanism and an appropriate tool that we should have available to us.

Senator PERCY. You would not have to then create a whole new second currency as you would under the coupon rationing plan?

Mr. SAWHILL. That is correct.

Senator PERCY. That would save an estimated $2 billion to administer the system and print the coupons. So you are trying to determine if this is the most feasible way.

Mr. SAWHILL. Yes.

Senator PERCY. But politically I recognize that this is a tough one.

Mr. SAWHILL. Yes. Well, we talked about that before.

Senator PERCY. We all do.

Mr. SAWHILL. I particularly, of course——

Senator PERCY. I am for it. But I am not up for election this year. [Laughter.]

But I was for it 6 years ago and 5 years ago and 4 years ago.

Mr. SAWHILL. I well remember.

Senator PERCY. I proposed a 30-percent gasoline tax 5 years ago, and I heard from southern Illinois and I am still for it.

Mr. SAWHILL. Well, I received some unfavorable comment with my advocacy of a gasoline tax in the past as well. But I would agree with you that it is a more efficient mechanism than other types of actions to deal with the disruption.

I might just go on then to the third category of emergency response action, which is fuel management. Such actions include oil to gas switching in the industrial and utility sectors and electricity transfers to use as much nonpetroleum-generated electricity as possible. I have outlined in my testimony a number of organizations that we are working with to insure that we are in a position to implement fuel-switching programs.

We have this Contingency Planning Office, that I mentioned to you earlier, headed up by Bart House. He has done considerable work on all of the different options I have outlined to you. He would be very pleased to review them with members of your staff and keep you up to date and posted on our progress in this area.

I would like to conclude my testimony by talking about U.S. policy in the international context. I do have with me Mr. Peter Borre, who is the principal Deputy Assistant Secretary for International Affairs, within the Department of Energy, to answer any questions and lead any discussion that you might want to undertake in that regard.

The point I tried to make is the importance that we attach to taking coordinated measures with our allies to deal with any kind of disruption that might occur.

We have made considerable progress in this regard under Secretary Duncan's leadership, and I think we now have a much more cohesive organization within the IEA and a much greater realization on the part of IEA countries about the need for coordinated action than we have had in the past.

I describe in my testimony some of the activities that we have undertaken, some of the programs that we have underway. For example, we have joined with the 20 other IEA countries in developing an emergency oil sharing system. I talk about the functions of that system. I also talk about the fact that the IEA countries and Ministers have now agreed that in the event of a supply disruption, they would come together to develop coordinated policies on dealing with measures to restrain demand. In other words, they are now committed to establishing individual oil import ceilings and are taking the appropriate measure to see that those ceilings are achieved in the event we had a supply disruption.

We are also reviewing carefully the potential for action by the 21 member countries to coordinate policies on commercial and strategic inventories. One of the fundamental lessons from the market disruption following the Iranian Revolution is that if consuming nations try to outbid one another during a period of market tension in an irresponsible scramble to accumulate inventories, they will only succeed in bidding up the prices, with no appreciable benefit in their supply position. Coordinated measures of restraint and carefully timed drawdown during periods of disruption could be, in conjunction with the other contingency planning actions I have described, an effective way of limiting price explosions of the kind we have recently experienced and the kind you depict in the chart here in the hearing room.

In concluding my statement, I want to emphasize that we have made some important progress in dealing with our energy problems. Imports are down, consumption of oil is down, drilling is up, and stocks are up. Alternative energy sources are actively being pursued.

However, as this committee well knows, the vulnerability of the United States and our allies to oil supply disruptions remains high and is likely to be so for the foreseeable future. Improved preparations to cope with such disruptions, if they occur, is a major activity of both our Department and other Federal agencies.

I have outlined our organizational structure for dealing with this critically important topic. I have talked about the information systems that we are putting in place. I have talked about some of the other major steps that we have taken and are pursuing. However, much remains to be done and we look forward to working closely with the Congress as we continue our efforts in this area.

Now, Mr. Chairman, I would like to conclude my statement and say that I and my associates would be glad to answer any questions that you might have.

Senator PERCY. Thank you very much, Dr. Sawhill. We are very pleased to be joined this morning by Senator Sasser, who has taken an intense interest in this field and has a good deal of knowledge in it. We would be happy to have any opening statement you might have.

Senator SASSER. Thank you very much, Senator Percy.

OPENING STATEMENT OF SENATOR SASSER

I first want to commend you and Senator Nunn for taking the lead on an issue of critical importance to the Nation.

The issue of America's emergency energy preparedness is a subject which we must deal with now, when gasoline stockpiles are relatively high, not during the next shortage. At our last hearing on the subject of fuel allocation, I expressed my concern that very little had been done in preparation for the next energy crisis. I fear that we are as vulnerable today to foreign governments disrupting our economy as we were a year ago. I am bothered that the strategic petroleum reserve has not been filled to capacity, and I wonder, could gas rationing ever work when it appears that start-up costs are staggering and lead-in time quite long?

The American public deserves to know what has and will be done to address these and other energy issues. We need to explore a wide array of options such as: Fuel-switching programs, emergency refinery utilization programs; the buildup of the strategic petroleum reserve and the formulation of set policies for the allocation of that reserve in time of shortages; the possibility of emergency taxes with simultaneous rebates; and emergency conservation plans.

Now I know that the Department of Energy has taken a lot of punches and I don't intend to throw any this morning. Some of the criticism of DOE is undoubtedly justified, but I know that the Department of Energy and Deputy Secretary Sawhill have made progress in many of these areas—particularly our long-term energy options. I look forward to hearing from Deputy Secretary Sawhill this morning to bring us up to date.

Senator PERCY. Thank you very much indeed. I might note personally I was glancing over earlier this morning Dave Broder's book on "The Changing of the Guard," the new book that he has out. The strongest criticism he has made of current politicians is that they never really look ahead, always engaging in crisis management but not until we get in the crisis. I will be making later this morning, with my daughter Sharon, a father-daughter critique of that book for the Today program with Tom Brokaw, and I will try to work into the script at least that this hearing does look ahead. We are not in the midst of the crisis, but I can think this morning at the opening of this hearing that we have a war in the Middle East on our hands that we had not anticipated.

It certainly points out, I think, the necessity of our really thinking ahead about what would we do if these hypothetical things occurred, and one of them seems to be occurring this morning.

I would feel that it would be wise if your colleagues will be testifying to have them all sworn in. We certainly welcome Abe Chayes this morning. I think his appointment as a special assistant to work on the strategic reserves is one of the best signals we have that the administration really intends seriously to undertake that field. Let me

swear all of you in. Do you solemnly swear to the tell the truth, the whole truth, and nothing but the truth, so help you God?

Mr. HOUSE. I do.

Mr. LINDEN. I do.

Mr. BORRE. I do.

Mr. CHAYES. I do.

Mr. NEWKIRK. I do.

TESTIMONY OF BART HOUSE, DEPUTY ADMINISTRATOR, ERA; AL LINDEN, ACTING ADMINISTRATOR OF EIA; PETER BORRE, PRINCIPAL DEPUTY ASSISTANT SECRETARY, INTERNATIONAL AFFAIRS; ABRAM CHAYES, SPECIAL ADVISER TO THE SECRETARY ON STRATEGIC PETROLEUM RESERVES; AND THOMAS C. NEWKIRK, DEPUTY GENERAL COUNSEL FOR REGULATION

Senator PERCY. Let's start right off with the assessment this morning. We have apparently a war between Iran and Iraq that has broken out. Dr. Sawhill, could you tell us what in your judgment the effect of such a war would have on the flow of oil from those two nations, how much oil for instance the United States would lose from a total cutoff of oil exports from these two countries?

Mr. SAWHILL. Let me just say this: Currently world oil stocks are 160 million barrels above normal operating requirements. Second, world oil production is some 2 to 2½ million barrels a day in excess of world oil demand. These figures were recently cited by John Lichtblau. We are in a situation where stocks are high and production is in excess of demand, so that if there were to be a disruption of oil from Iran and Iraq it would be less damaging than perhaps might have been the case in the past when stocks were lower and the supply-demand situation was different.

Total oil production or total oil exports from Iran and Iraq combined are about 3½ million barrels a day. How much of that would be impaired in the event that the hostilities were escalated, I wouldn't be prepared to estimate.

Senator PERCY. In that figure, is that Iran and Iraq or Iraq only?

Mr. SAWHILL. Iran and Iraq.

Senator PERCY. Three and a half million?

Mr. SAWHILL. Yes. The Iraqi exports are about 3 million barrels a day or somewhat in excess of that, and Iran exports are about 500,000 to 600,000 barrels a day. So this is the total exports of these two countries. But I think we have to look at that amount of exports in the context of the much improved world stock situation and the differing supply and demand balance than we may have had when past disruptions have occurred.

Senator PERCY. I wonder if you could comment, even though we do have production in excess of demand today, what would happen to the price of crude oil if a bombing of the oilfields, disruption of supply lines cut off Iran and Iraq exports of 3½ million barrels a day. What would happen over a period of a couple of months to the price of crude?

Mr. SAWHILL. There is no question that it would go up. The amount of the increase, however, would depend upon the extent of the disrup-

tion in oil supplies and a variety of other factors that are difficult to predict in advance. But one of the reasons that we are trying to put a contingency planning program in place and trying to cooperate with our allies on such things as the acquisition and disposition of strategic stocks, is so that we can deal effectively with a crisis such as the one you described.

Senator PERCY. One of the most important things a department such as the Department of Energy can do is to look ahead and forecast what would happen under a given set of circumstances and in the creation of the Department of Energy, which was created by this committee, we talked about future crises. Just before the 1979 shortage your predecessors at DOE made three price projections in the second national energy plan. As I indicated in my opening remarks we have already exceeded DOE's high price projection for 1990 and this is only 1980. How could these projections have been so wrong? How can we be sure that perhaps your own estimates are not, figures, are not an underestimate of the impact of the Iran-Iraq oil cutoff of oil prices? You said it would go up. Can you indicate if there was a prolonged cutoff what the price might go up to?

Mr. SAWHILL. I would be very reluctant to try to make any specific forecast of what would happen to price. I think your very statement indicates how difficult it is to forecast price changes.

Senator PERCY. Is it conceivable that we could be thinking in terms of $100 a barrel oil sometime in the future, $4 a gallon gasoline and very, very high, far higher home heating costs than we are now experiencing if we have such a cutoff?

Mr. SAWHILL. I wouldn't want to predict any level of price. As I indicated, I think the price would go up but the extent of any increase would depend on a whole variety of factors that I think are difficult to predict in advance. In part we can cushion any price increase by the way in which we manage the situation; that is, how effectively we substitute alternative fuels for oil, how effectively we begin to use electricity generated from nonpetroleum sources, how quickly we work with our allies to coordinate the management of our strategic reserves. These things can all impact the extent of any price increase that might occur.

Senator PERCY. With current prices—not benchmark prices, but actual prices—going up to $35, if we had a 20-percent prolonged 20-percent shortfall, would we be looking at or approaching the $100 a barrel price if it stayed on for some period of time?

Mr. SAWHILL. I would be very reluctant to make any prediction about prices.

Senator PERCY. In my judgment I think if we had that prolonged supply cutoff we would probably double the present crude prices at least. If we did double the present crude prices what kind of an effect do you think that would have on the American economy?

Mr. SAWHILL. When prices go up, obviously this does have an impact on the economy. It affects the gross national product, it affects economic growth, it affects employment, and that is why I think it is important that we have a program in place to cushion the impacts of price increase caused by a disruption. That is why the kind of tax with a rebate mechanism, the management of stocks, and the substitution of other fuels for oil becomes so important.

Senator PERCY. I wonder if you could tell us just how much would our record private oil stocks help us in case we lose all the oil from Iran and Iraq right away? During the crisis from 1976–79, the oil companies increased their inventories rather than drawing them down to offset the shortage. While it is true brimful tanks may keep the oil companies from adding to the stocks if a shortage arose today, how can we be confident that the oil companies would dip into these stocks in time of emergency?

Mr. SAWHILL. We would certainly put in place a program to work with the industry to manage these stocks in a way that would minimize the adverse impact of the curtailment. I might say to you that the amount of oil that we get from Iran and Iraq is very small.

Senator PERCY. Would it be a natural inclination, however, of the management directors of oil companies, that they would in the event of a crisis begin to draw down heavily their inventories or would they have to be in a sense directed to do so? Would they tend to sit on their assets, you might say? [Laughter.]

Mr. SAWHILL. We have a system in place now to monitor the stock position of the industry very closely. We get figures on a weekly basis from 30 or 35 of the larger companies on their inventory situation and we would be in a position to know what they are doing and to take appropriate action in the event that we felt it was necessary to encourage stock drawdowns.

Senator PERCY. Let's look at our own strategic petroleum reserve. Let's assume we do lose 3½ million barrels a day because of a war between Iran and Iraq. Do you think we should draw down the reserve right away to resist upward pressure on crude prices, or should we hold on to these reserves as a hedge against an even more uncertain future?

Mr. SAWHILL. I think our stock management policy would depend upon the nature of the curtailment, how long we expected it to last, how effectively we felt we could utilize private stocks, and what our allies were doing.

Senator PERCY. If the oil companies do not draw down stocks, do you have at DOE sufficient authority to do something about it?

Mr. SAWHILL. I believe we do have sufficient authority.

Senator PERCY. Do you have any idea how long you might wait and what would happen before you exercised that authority?

Mr. SAWHILL. No. I think that would depend upon how we saw the stock situation unfolding.

Senator PERCY. My problem is if we are not expected to draw down our own strategic reserves right away, then how would we really expect oil companies to immediately draw down their private stocks? If drawing down strategic reserves is in the public interest, as a way of restraining the world oil prices, isn't it better to use the strategic reserve and not private reserves for this purpose then?

Mr. SAWHILL. I think probably some combination of the two, but again, it would depend upon the nature of the situation that we faced.

Senator PERCY. I know that there is a reluctance by you to declare a policy that will draw down on the strategic reserves during a shortage. Looking at it again from the standpoint of American industry where their overall purpose and objective is quite different, and given that the Federal Government has its own strategic reserves, don't

you think American industry could plan their own stock management strategies better if they had a clear idea of how the strategic reserve might be used? Shouldn't we really figure out what we will do and put them on public notice that in the event of an emergency this is what we will do?

Mr. SAWHILL. I don't think we should declare in advance what we would do in a hypothetical situation, but I do think that once an emergency occurs, it is important to act quickly, we would be prepared to do so.

Senator PERCY. After my final question, I will turn to Senator Sasser. Would we have more leverage over crude prices in an emergency if we had, let's say, 250 million barrels in the strategic reserve as we originally had planned to have by this year, 1980, instead of just 92 million barrels?

Mr. SAWHILL. I think it is important to continue to add to the strategic reserve. The larger it is the better position we will be in to deal with an emergency and that is why I indicated to you that we are resuming filling the strategic reserve and intend to pursue that policy.

Senator PERCY. Senator Sasser?

Senator SASSER. Thank you, Senator Percy.

Dr. Sawhill, Senator Percy was referring to a hypothetical price of $100 a barrel for oil which indeed is a shocking price, but judging by what we have seen over the last 4 or 5 years it is a price that could at some juncture be well within the realm of probability. As a means of guarding against perhaps unwarranted OPEC oil price increases, some of us have supported the production of synthetic fuels in this country. As I understand it, the long-term goal is to produce 2 million barrels a day of synthetic fuels. This would, I think, markedly lessen our dependence on foreign oil imports particularly with the good news we have had just the past few months in the cutback on foreign oil imports.

Could you give us today a rough time schedule on how we will approach this 2 million barrels a day goal in the production of synthetic fuels?

Mr. SAWHILL. Yes, sir. The Congress in passing the Energy Security Act, has established targets of 500,000 barrels a day of production by 1987 and 2 million barrels a day of production by 1992. As you know, the President has nominated me to become Chairman of the Synthetic Fuels Corporation and I am very committed to these goals. I think it is very important that we get on with the job of creating a synthetic fuels industry in this country and I think we should do so with the utmost urgency.

Establishing the Synthetic Fuels Corporation and moving forward with this program will send the right message to OPEC. It will send the right message to American industry that we are serious about getting on with this job. Frankly, it is mandated in the legislation that we be out with solicitations by December 30, which means that these solicitations have to be prepared and reviewed with our advisory committee of the Synthetic Fuels Corporation by November 30. I am very hopeful that the Senate will act on the President's recommendations.

Senator SASSER. Dr. Sawhill, yesterday we received, I think, some encouraging news. The story I saw in the Washington Post indicated

that gasoline consumption in 1980 is almost 7 percent less than it was in 1979, which in turn was less than it was in 1978. The shipments of imported oil into this country in July dropped to a 5-year low of 4.8 million barrels a day. The further good news which you touched on in your statement is that we presently have more than enough heating oil and natural gas stocks to weather the coming winter.

Apparently we are doing something right and the Department of Energy is doing something right in the field of conservation if we can so dramatically cut the importation of foreign oil and so dramatically cut the consumption of gasoline.

Would you detail for a minute some of the more successful conservation initiatives that DOE is presently mounting in the energy emergency preparedness program?

Mr. SAWHILL. It seems to me that the reason why the American people are responding so well to the energy situation that we face today, why we have cut back consumption as you indicated, is principally because of the steps that have been taken to send the right signal to the American people and by that I mean that we have decontrolled the price of oil or have a program to do that. We have a program to move natural gas prices up to world levels and as a result the American people now understand that energy will be scarcer and more expensive in the future and they have taken actions to purchase smaller, more energy-efficient automobiles, to insulate their homes, to do a variety of other things that will mean that we become a more energy-efficient economy in the future. And the Department of Energy, through its advocacy of programs to retrofit homes to make them more energy efficient, a program that has been pushed very hard by Senator Bradley, and mandatory efficiency standards for automobiles, appliances, and other energy-using consumer products are all contributing, I think, in this regard.

Senator PERCY. I wonder, Senator Sasser, if you would yield for just a moment? I would like to welcome Senator Bradley, though not a member of this subcommittee, he is a very important force on the Energy Committee and has been a real leader in this very field of conservation. As a valued member of the Alliance to Safeguard Energy, along with 170 Members of Congress, obviously one of our closest advisers is Dr. Sawhill, who helped us found it. I understand that the Minister of Energy of Great Britain said he drooled when he hears of this. The Advertising Council has now totaled $54 million of contributions from advertising of the Alliance to Safeguard Energy, featuring Gregory Peck—print magazine, newspaper ads, radio, and television I think at a cost of some $350,000 to the Alliance.

When we put the Alliance to Safeguard Energy together as a private organization of labor, management, consumers, academicians, and government, we realized it could have a lot more impact than a Government agency. I think it has gone a long way.

I would like to ask this question as a followup to Senator Sasser and then yield right back to him. I remember very well the intelligence briefing we had on the difference between the U.S. economy and the Soviet economy, that we were fat, in essence. We were wasters of energy to the extent that we could just cut down and create a whole new source of supply through our conservation measures. The Soviet Union is very hard and lean, does not have much consumer consump-

tion, automobiles, gasoline, and all of that. There is not much it can cut out.

As we conserve more, and we get much more efficient, doesn't that, in a sense, increase our vulnerability? It is a good thing we have done what we are doing, but in the future we may not have as much leeway. Isn't that correct?

Mr. SAWHILL. I would say we still have a long way to go.

Senator PERCY. We shouldn't disband the Alliance yet?

Mr. SAWHILL. Not yet. We can make our cars a lot more energy efficient, our industry has a very great opportunity to become more energy efficient, and under Senator Bradley's leadership, I think we are going to do a great deal to show the kind of savings we can make in the residential and commercial building area as well.

Senator PERCY. We are beginning to take some of the easiest routes we have, and we may get a little bit tougher with a little more ingenuity.

Thank you.

Senator SASSER. Thank you, Senator Percy.

Dr. Sawhill, an interest of mine and I am sure also an interest of Senator Bradley's has been the filling of the strategic petroleum reserves. That is a key element in our energy emergency program, I would gather. There have been warnings of how the OPEC nations would react to us stockpiling petroleum and filling up the strategic petroleum reserves, reactions particularly from the Saudis who have in the past been helpful at least in the increase in production and perhaps have exercised some measure of price restraint. What kind of reaction would you expect from the OPEC nations if we were to proceed full time with filling the strategic petroleum reserve as rapidly as possible?

Mr. SAWHILL. I can't anticipate the reaction of other governments to actions that we might take. I do think it is important that we begin filling the strategic reserve. As you will recall, the oil shipments to the reserve were terminated last year during the Iranian crisis, when we had long gasoline lines and very tight market situations. That condition no longer exists. There is surplus oil on the world markets and I believe we should begin resuming the fill of the strategic reserve and we have begun to do so.

There is oil now flowing from the Elk Hills Naval Petroleum Reserve to the strategic reserve and we have recently concluded agreements under which we will begin filling the reserve at the rate of about 100,000 barrels a day with Elk Hills oil and that oil should be flowing into the strategic reserve sometime in October.

Is that incorrect?

Mr. CHAYES. It has begun to flow this morning.

Mr. SAWHILL. Good. In late September. [Laughter.]

Senator SASSER. I think we can agree that in view of the excess amount of oil on the market—in fact some have characterized and used the overworked word that there is an oil glut on the world market—I think we can agree that this would be a good time to begin the additional purchase of oil supplies and move as expeditiously as we can to fill the reserves.

Dr. Sawhill, it is apparent to me that if we have a serious energy emergency in the future that all three levels of government—Federal,

State, and local—are going to have to act in concert to help us weather this crisis.

Now, my question is this: How well prepared are State and local governments to assist the National Government in managing the energy crisis? Also, what has the Department of Energy done to help get State governments better prepared?

Mr. SAWHILL. I indicated in my testimony that we have established an Energy Liaison Center within the Economic Regulatory Administration to enhance our ability to communicate with State and local governments.

I have been working very hard with the Congress in this session to gain passage of the Energy Management Partnership Act. This is an act that would provide funding for State and local government energy planning. If that act is passed, and I hope it will be—it has been passed by the Senate; the House has given that a rule as of last Friday so that I hope a similar bill will be passed in the House—that will significantly improve our ability to work with State and local governments.

Senator SASSER. Dr. Sawhill, one final question, then I will yield to Senator Bradley.

Some of the critics of the Synthetic Fuels Corporation say that if the total amount of $80 or $88 billion, which is being allocated to the development of synthetic fuel production, is used wisely; that is if every dollar is used as well and as efficiently as it can be used, that we are still not going to be able to do enough to produce enough to have any real impact on the energy demands of this country or the energy needs of this country.

How do you react to those critics? What do you say?

Mr. SAWHILL. I believe if we can achieve the goals that are outlined in the Energy Security Act of 2 million barrels of oil per day by 1982 that it will have a significant impact, that it will send the right signal to OPEC that we can provide the alternative fuels to OPEC oil in sizable quantities.

So, I think the impact will be there if we can reach the goals that the legislation has set forth for us.

Senator SASSER. These same critics say that the Government got in the business during the Second World War of trying to produce synthetic rubber, and we did not have a great deal of success in that regard, that that program was almost a disaster.

These critics also say that it appears the Synthetic Fuels Corporation is headed in the same direction. How do you respond to those critics?

Mr. SAWHILL. I don't know in detail the history of the synthetic rubber industry and won't be prepared to defend it. I can say this: The Synthetic Fuels Corporation has been created to be a catalyst. It is designed to provide private industry with the financial incentives so that private industry can do the job. The Government is not going to get into the synthetic fuels business. The Government is going to provide the financial incentives so that industry can move quickly to create commercial production of synthetic fuels which is consistent with the goals of the legislation.

Senator SASSER. One final question, Senator Percy.

Dr. Sawhill, our dependence on foreign oil imports is not altogether a new phenomenon. As far back as 1969, for example, we were importing about 22 percent of our oil from abroad and much of it at that time from the Persian Gulf region.

Now, did previous administrations have any comprehensive energy emergency preparedness plans to combat oil cutoff, to your knowledge?

Mr. SAWHILL. No. I think that it has only been in the last year certainly and in the last few years that we have moved to put in place a comprehensive program.

Senator SASSER. So, the Department of Energy has started from scratch and has no previous foundation on which to build energy emergency plans. Is that a fair statement?

Mr. SAWHILL. I think that is a fair statement.

Senator SASSER. Thank you, Senator Percy. Thank you, Dr. Sawhill.

Senator PERCY. Senator Bradley, we are happy to have you join us. If you will proceed, the staff will let us know when the 10 minutes has expired.

Senator BRADLEY. Thank you very much, Mr. Chairman.

I want to compliment you for holding this hearing on emergency preparedness. This is an area of energy policy that is like a dark bin. I think that as much light as we can shine on it, the better because there are very significant policy questions that we have to confront as a government and that I think need very specific answers by the witnesses who are here today who have had for the last several years responsibility for the emergency preparedness program.

I would like Dr. Sawhill or any of his accomplices at the table——

[Laughter.]

Mr. SAWHILL. Colleagues.

Senator BRADLEY. Colleagues, sorry—colleagues at the table to explain for the record what they perceive as the most likely scenarios that could cause an oil supply disruption in the next several years.

I would like to know how do you identify an emergency?

I heard before I got here that you said we could easily manage if the Abadan refineries went out; that if we lost all the oil in the disputed area between Iraq and Iran, that we could manage that.

Mr. SAWHILL. I didn't say that. I want to make that clear. I don't think anybody at the table said that.

Senator BRADLEY. All right. Then I would like you to tell the committee what level of interruption are you planning for? What is the probability of that interruption?

We have had two interruptions in the last 6 years. That is a one in three probability. Three interruptions in the last 30 years. That is a 1 in 10 probability.

What is the probability of an interruption in the future and what level of interruption is most probable? Is it 3 million barrels a day, 8 million, 10 million, 15 million? What specifically are the measures that you are taking to counter that probable interruption?

I would like you to go right through all the steps beginning with how you assess the probability of a supply interruption. I would like to know how you do it, to the level of how you decide what policies will meet the kind of interruption you consider most likely.

Mr. SAWHILL. We have taken a little bit different approach, rather than trying to assess what an interruption would be and what the level of probabilities associated with that interruption might be. I don't think that would be a very meaningful way to proceed because I don't think we could give you, in a convincing way, probability estimates associated with different levels of shortage.

My feeling is that what we have to do is assume that there will be different levels of supply disruption, such as 1 million barrels a day or 3 million barrels a day, and then we have to develop a series of actions that would be available to us in the event such a disruption occurred.

Then, if a disruption does occur, we have to look at the cause of the disruption, our best estimates of the length of disruption, our estimates of the impact of that disruption on ourselves and our allies and select from the different measures that we can take the specific actions to deal with that specific case.

Senator BRADLEY. Let me interrupt there and ask you if you would agree that if you expect the interruption to be no more than 2 or 3 million barrels a day, that would mean different policies than if you expect the interruption to be 10 million barrels a day?

Mr. SAWHILL. Yes.

Senator BRADLEY. What would be the different policies for each set of interruptions?

Mr. SAWHILL. I am not sure I can tell you in advance what the policies would be.

Senator BRADLEY. Then how do you plan for an interruption?

Mr. SAWHILL. You plan for a disruption by looking at the whole range of policies and then, when you get a disruption, then you select those policies that are best taken to deal with that.

Senator BRADLEY. You said in the record that there are different policies for a 2 million barrel interruption and a 10 million barrel a day interruption.

Mr. SAWHILL. Yes.

Senator BRADLEY. Are you saying we are planning for both a 2 million and a 10 million barrel interruption?

Mr. SAWHILL. I don't think we are planning for a specific interruption as much as what we are trying to do is say these are some kinds of disruptions that could occur, and this is a set of policies that we would undertake to deal with disruptions. And when a disruption occurs, then we select those policies that are most appropriate for the level of disruption, for the length of disruption and so forth.

We would select, as I indicated, different policies for dealing with a very large disruption than for dealing with a smaller disruption.

Senator BRADLEY. Could you take both the small, 2 to 3 million barrel disruption and the 10 million barrel disruption and talk about the different policies each would require and also address whether you think there is anything that must be done now instead of waiting for the disruption to select which policy is applicable?

Are there things we must do now to prepare for a 2 or a 10 million barrel disruption?

Mr. SAWHILL. Yes. I think there are things we could do to prepare. For example, I think it is important we develop an on-the-shelf gas rationing plan. I think it is important that we develop a tax and rebate system. I think it is important that we develop relationships

with States and local communities so that we can effectively communicate with them. I think it is important that we have an organization in place, that we have adequate information systems.

All of these things we should do in advance so that when a disruption occurs, we can deal with it.

Senator BRADLEY. So that is all? I mean you are saying that those are the only things we have to do now?

Mr. SAWHILL. No. Well, other things that we have to do are develop information on the level of private stocks and think through ways in which we might want to encourage private stocks to stay at their current high levels so that we have that buffer.

We have to begin filling the strategic reserves I earlier outlined. We have to make sure that we have a variety of demand restraint actions available to us. We have to work with private industry on possible fuel switching programs so that when a disruption occurs we can quickly switch from oil to natural gas and other fuels.

These are other steps I think we should take.

Senator BRADLEY. Might you describe the differences between preparing for a 2 million barrel and a 10 million barrel disruption?

Mr. SAWHILL. Well, that would depend upon the——

Senator BRADLEY. What things might you consider if there was a 10 million barrel disruption that you would not consider in a 2 million barrel disruption? How can you be sure that a 2 million barrel disruption wouldn't quickly escalate into a 10 million barrel disruption?

Mr. SAWHILL. You can't be sure. That is why I hesitate to set forth specific policies for a particular disruption, because the circumstances surrounding that disruption will really determine in large part the kinds of policies that one would pursue.

Senator BRADLEY. But you just outlined a number of steps we should take now to prepare for a disruption.

Mr. SAWHILL. That is correct.

Senator BRADLEY. You stated earlier that there are different plans for a 2 million barrel and a 10 million barrel disruption.

Mr. SAWHILL. I said there would be different responses; yes.

Senator BRADLEY. Would there be different plans prior to the disruption? If you were planning——

Mr. SAWHILL. I apparently haven't made myself very clear.

I think that what we need is a whole set of policies, a whole range of policies, and then when a disruption occurs, we review the nature of the disruption, the size of the disruption, the level of the disruption, our estimate of how long it might continue, our defense requirements in the event that it requires some Defense Department activity, and then we decide on how to respond.

But we have the organization in place, the information systems in place, and the measures on the shelf so that we can act quickly. I think that is what is important.

Senator BRADLEY. We know that it will take a year to get rationing to the point where it could be used if there was a disruption.

Mr. SAWHILL. Correct.

Senator BRADLEY. So, you are beginning to put in place a rationing plan that a year from now, if there were a disruption, might be useful?

Mr. SAWHILL. Yes.

Senator BRADLEY. Now, there are other policies that you have talked about following that largely deal with some form of conservation or another. You mentioned the strategic petroleum reserve. If you expected that the Iraqi-Iranian dispute was going to escalate and indeed the oil-producing capability of Iraq and Iran in the region under dispute would be lost, would you place a greater emphasis on filling the strategic petroleum reserve?

If you assumed that a 10-million-barrel-a-day loss in the next year was more probable than not, wouldn't that argue for a greater fill than 100,000 barrels a day?

Mr. SAWHILL. I think there are a whole variety of considerations that enter into how much oil to put into the strategic reserve.

The important thing, it seems to me, at this point is that we begin refilling the reserve and constantly assess the market situation and determine whether or not we should increase the level of oil.

Senator BRADLEY. Let's go back to the question now. If you assumed that there was a high probability in the next year that we would lose 10 million barrels of oil a day out of the world market, wouldn't you then argue to fill the reserve at greater than 100,000 barrels a day?

Mr. SAWHILL. Well, you know, my assessment of whether or not to fill the strategic reserve would depend upon what my intelligence told me about the probability of a disruption. But it would also depend upon my assessment of the conditions in the marketplace.

Senator BRADLEY. So that you would put price ahead of national security?

Mr. SAWHILL. No. I hope I didn't say that. I certainly didn't mean to.

Senator BRADLEY. You said conditions in the marketplace.

Mr. SAWHILL. I think conditions in the marketplace are something we have to consider.

Senator BRADLEY. You mean such as there being a surplus in the world markets exerting downward pressure on the price?

Mr. SAWHILL. And the impact upon our entering the market on price. It seems to me that we have seen a softening of price in the world markets, and that is beneficial to our economy.

We have to consider what a resumption of SPR fill would have upon the world—upon oil prices. Our assessment right now is that we should begin filling the SPR and we are. And I think that is the important point.

Senator BRADLEY. Would you say that a fill of 300,000, 400,000, 500,000 barrels a day would put an upward pressure on price, given the present world surplus?

Mr. SAWHILL. I am not sure that I could answer that question.

Senator BRADLEY. Is anyone making that analysis, since that is one of the criteria you have stated you would have to consider?

Mr. SAWHILL. Yes; we are constantly reviewing the market situation and trying——

Senator BRADLEY. What is the latest analysis on the effect of a 400,000 to 500,000 barrel a day fill on price?

Mr. SAWHILL. I couldn't answer that question.

Senator BRADLEY. Is anyone making that analysis?

Mr. SAWHILL. We could certainly try to give you some data that would enable you to draw your conclusions.

Senator BRADLEY. Who would that data come from?

Mr. SAWHILL. From the Department of Energy.

Senator BRADLEY. Who would be the responsible person?

Mr. SAWHILL. I think we would coordinate across the Department. We would ask our Energy Information Agency, our policy evaluation——

Senator BRADLEY. Could I ask the Information Agency: Have you ever done an analysis on the effect of price on the fill of the strategic petroleum reserve?

Mr. LINDEN. Yes. And I believe we provided that to you earlier.

Senator BRADLEY. Could you tell the committee, because they didn't benefit from that study, what that study concluded?

Mr. LINDEN. I personally do not recall, but I would be glad to provide you information.

Senator BRADLEY. Did you do the study?

Mr. LINDEN. I did not personally do it; no.

Senator BRADLEY. Who did it in the agency?

Mr. LINDEN. In the EIA, the Office of Applied Analysis under the direction of Dr. Lincoln Moses.

[The study referred to follows:]

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Filling the Strategic Petroleum Reserve: Its Price and Economic Effects

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PREFACE

This report was prepared at the request of Senator Bill Bradley at a hearing before the Subcommittee on Energy Regulation of the Committee on Energy and Natural Resources on October 22, 1979. It presents estimates of the possible effects of filling the Strategic Petroleum Reserve in the United States on world oil prices and economic activity in the United States and other countries. The report addresses different hypothetical assumptions which relate to having one billion barrels in the Reserve by either 1985 or 1989, the general state of the world oil market, and the possibility that OPEC might respond to our filling the Reserve by cutting its production by as much as one million barrels per day.

The International Energy Analysis Division of the Office of Integrative Analysis prepared the report.

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EXECUTIVE SUMMARY

This study estimates the possible effects on world oil prices and economic activity of filling the Strategic Petroleum Reserve in the United States. It addresses different assumptions relating to alternative fill rates and the possible response of the Organization of Petroleum Exporting Countries (OPEC) to filling the Reserve. The study estimates the state of the world oil market with no filling of the Reserve, using a preliminary world oil price projections developed by the Energy Information Administration (EIA) for its 1979 Annual Report to Congress. The world oil price projections assume a low OPEC supply of oil with the consequence that, given the economic growth of the world economies, real world oil prices increase at an annual average rate of 6.1 percent through the eighties. Two different fill rates are used, with the first based on a recent Department of Energy plan for filling the Reserve to just over one billion barrels by 1989. This plan will be called the 1989 Target case. The second fill rate scenario assumes that one billion barrels of oil are to be in the Reserve by 1985 (1985 Target case). A severe OPEC retaliation scenario is also evaluated, which assumes that OPEC will cut its planned production capacity by one million barrels per day whenever oil is being purchased for the Reserve.

A further assumption is that during the period the Reserve is being filled, there will be no disturbance in the world oil market requiring the use of the Reserve and disrupting the specified fill rates and their associated costs.

The main emphasis in the analysis is on the oil price and economic effects of the 1989 target plan (without OPEC retaliation), because this plan or some variation based on it is under active consideration by DOE. This scenario assumes a neutral response by OPEC in the sense that it assumes OPEC responds to our filling of the Reserve as it would to any other autonomous increase in the demand for oil.

The consumption, production, and oil imports for selected countries and the world price of oil are estimated by using EIA's Oil Market Simulation (OMS) model. With these world oil price and quantity estimates, the macroeconomic models can estimate the economic impacts of the Reserve on the United States and, for the more severe OPEC retaliation case, other economies of the world.

1989 Target Plan

The 1989 Target plan results in estimates showing an increase in 1980 in the world price of oil of $0.90 per barrel (1979 dollars) above the price that would prevail if there were no Reserve buildup. During the middle years of the decade, the estimated world oil prices average $0.15 per barrel above the baseline price of no Reserve. By the end of the decade, the

prices are $1.30 per barrel above the baseline. The increase in prices from 1979 to 1980 reduces free world demand by approximately one million barrels a day. The higher price levels, both with and without the Reserve, keep demand essentially stationary throughout the middle years of the decade. This lack of growth in demand results in spare capacity developing in OPEC, which, in turn, accounts for the relatively negligible increment to price in those years, particularly when viewed against price levels in the $30.00 to $40.00 per barrel range.

The major effect of filling the Reserve on the United States economy is that a downward pull on real output and a small, barely discernible upward pressure on inflation rates and unemployment could occur. The average estimated loss in real output is $4.6 billion (1972 dollars) per year over the decade, or approximately 0.3 percent below the baseline real output.[1] As used here, real output is defined by Gross National Product (GNP) adjusted for inflation. For the period 1980 through 1985, when the difference between the world oil prices of the base and disturbed cases becomes smaller, the average annual loss in real output is $3.2 billion (0.2 percent below the baseline). For the rest of decade, the loss in real output averages

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[1] The average annual loss in 1979 dollars is $7.6 billion for the decade, $5.3 billion for 1980-85, and $11.3 billion for the rest of the decade.

$6.8 billion annually (0.4 percent below the baseline). This last period accounts for approximately 50 percent of the cumulative loss reflecting the acceleration of the rate of growth in world oil prices relative to no Reserve buildup.

The Reserve buildup adds approximately 0.1 percentage points to the average annual rate of inflation and 0.1 percentage points to the unemployment rate in the 1980s. The estimated inflation and unemployment rates show small variations from year to year reflecting the adjustment of the economy to the oil price shock.

In summary, the estimated movements of the economic indicators under the 1989 target plan (with no OPEC retaliation) are small and could be considered almost negligible when viewed against the size of the economy and the error properties inherent in the macroeconomic model. Therefore, it cannot be firmly stated that a significant loss in real output and increases in inflation and unemployment occur in filling the Reserve.

Sensitivity Analyses. Accelerating the fill rate to meet the 1985 Target (without OPEC retaliation) could increase world oil prices from $0.90 to $1.00 above the base case of no Reserve buildup for the year 1980-1985. For the same period, this results in an estimated average decrease in real output of 0.6 percent per year below the baseline level for the United States, an increase in the inflation rate by an

average of 0.3 percentage points per year, and an increase in the unemployment rate by an average of 0.2 percentage points per year above their baseline values.

In the OPEC retaliation scenario, the world oil price is projected to rise immediately by 19.6 percent above its baseline level, and, by 1985, to be 6.1 percent above the baseline level for the 1989 Target, and 8.4 percent for the 1985 Target. The average loss in real output in the United States could be 0.8 percent below the baseline value for the year 1980-85 for 1985 and 1989 target. The GNP deflator could be greater by an average of 0.8 percentage points, and the unemployment rate greater by an average of 0.5 percentage points per year when compared with their baseline values.

1. INTRODUCTION

The Energy Policy and Conservation Act (PL 94-163), authorized the creation of the Strategic Petroleum Reserve (SPR) for the purpose of reducing,

> "...the vulnerability of the United States to the effects of a severe energy supply interruption, and provide limited protection from the short-term consequences of interruption in supplies of petroleum products" [PL 94-163, Sec. 151. (a)].

Since the passage of the Act, some reserve sites have been developed and partially filled with oil. During the early stages of the Iranian crisis, however, the filling of the Reserve was suspended, but it will have to resume if the Administration's volume of 500 million barrels in the Reserve by 1985 is to be met. The world oil market is clouded in uncertainty because of the political unrest in the Middle East, questions as to what the future price and production policy of the Organization of Petroleum Exporting Countries (OPEC) will be, the increased likelihood of an oil supply interruption, and OPEC's possible retaliatory response to filling the Reserve. In the face of these uncertainties, there is a question about the effects on world oil prices and economies if filling of the Reserve is to be resumed.

This paper provides estimates of the possible effects on world oil prices and the economies of the United States and other countries of filling the Reserve under different assumptions. Assumptions include the Reserve's fill rate,

the general state of the world oil market, and OPEC's price response to filling the Reserve. The analysis focuses on the Reserve's oil acquisition cost, the major cost of the Reserve, but does not consider the storage cost of the oil.

Figure 1 summarizes the methodology used in the analysis. The Oil Market Simulation (OMS) model of the Energy Information Administration (EIA) generated the world oil market forecasts. The levels of OPEC production capacity were estimated by DOE/ International Affairs, and OMS was used to quantify the oil price increases (or decreases) and the resulting change in world demand and supply that would be consistent with the respective OPEC capacities. The price response parameters used within the OMS methodology were derived using DOE/Policy and Evaluation's FOSSIL2 model and EIA's International Energy Evaluation System (IEES).[1]

The FOSSIL2 model was used to forecast domestic petroleum production and imports under two alternative price projections. The FOSSIL2 results were used to calibrate EIA's OMS model, i.e., the FOSSIL2 results were used to estimate the response

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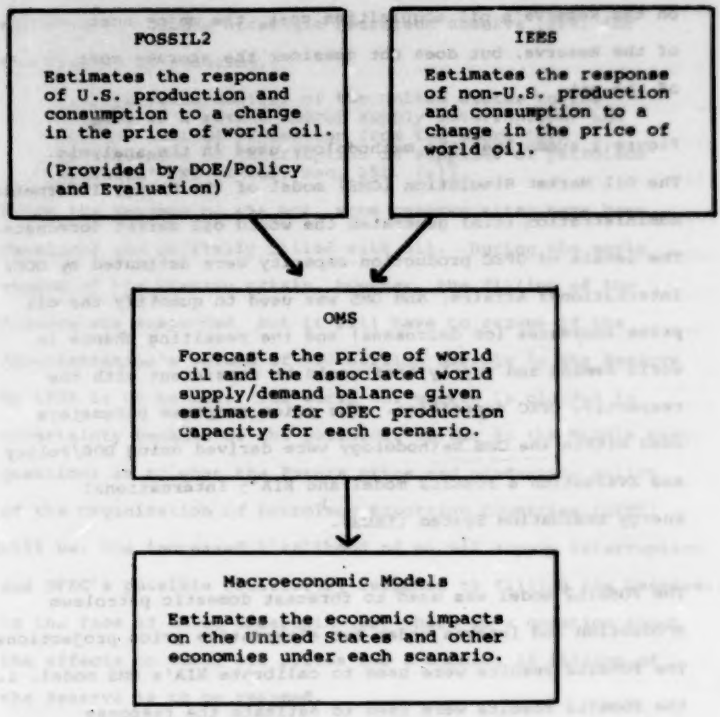
[1] IEES is described in Logistics Management Institute, The International Energy Evaluation System, Volumes I and II, September 1978.

For a discussion of the OMS model, refer to Appendix B of An Evaluation of Future World Oil Prices, AM/IA-78-05. For a discussion of the FOSSIL2 model, refer to Appendix B of DOE's National Energy Plan II.

Figure 1. Methodology Used in SPR Fill Analysis


FOSSIL2
Estimates the response of U.S. production and consumption to a change in the price of world oil.
(Provided by DOE/Policy and Evaluation)
IEES
Estimates the response of non-U.S. production and consumption to a change in the price of world oil.
OMS
Forecasts the price of world oil and the associated world supply/demand balance given estimates for OPEC production capacity for each scenario.
Macroeconomic Models
Estimates the economic impacts on the United States and other economies under each scanario.

of U.S. petroleum supply and demand to a change in the world oil price. Non-U.S. price responses were calibrated from the IEES model based on preliminary forecasts for EIA's 1979 Annual Report to Congress. Finally, the OMS model was used to quantify the world oil price changes for each of the Strategic Petroleum Reserve scenarios addressed in this paper.

Two macroeconomic models provided the economic impact estimates. The United States economic impacts were derived from the Wharton Econometric Forecasting Associates, Inc. (WEFA), Annual and Industry model, while the international economic impacts for the OPEC retaliation scenarios were derived from the WEFA and SRI International World model. In this model, the countries are linked together through international price and trade flows. The WEFA/SRI model covers the 25 Organization for Economic Co-Operation and Development (OECD) countries, regional models of the developing countries, and the Centrally Planned Economies.

The world oil prices, and where appropriate the various countries' consumption, production, and imports of oil derived from the OMS model, were used as inputs in all of the above macroeconomic models.

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2. SCENARIO ASSUMPTIONS

Table 1 summarizes the scenarios used in the analysis. The assumptions were designed to give different estimates of the price and economic impacts under different fill rates for the Reserve and different production responses on the part of OPEC.

The world oil market is described by a world oil projection through the year 1990, which represents a low oil supply situation. This case assumes no purchases for the Reserve and constitutes the base case (referred to as NOSPR), against which the world oil price and economic impacts were calculated. The low supply projection reflects a conservative policy with respect to oil production by the OPEC members.

In each of the scenarios that follow, it will be assumed that while the period the Reserve is being filled, there will be no disturbances in the world oil market or other emergency requiring the use of the Reserve or disrupting the specified fill rates and their associated costs.

Scenarios SPR1 and SPR3 show the increment in world oil demand resulting from the Reserve purchases and the resulting impact on the world oil market. Two alternative fill rate schedules are shown in Table 2. Scenario SPR1 uses a recent DOE fill rate schedule in which the Reserve is to be completed by 1989. The size of the Reserve for each year is

Table 1. Scenario Assumptions

Scenario Name	Target Year for 1 billion barrels in the Reserve	Retaliation
SPR1	1989	No
SPR3	1985	No
SPR7	1989	Yes
SPR11	1985	Yes

Table 2. Size of Reserve
(Millions of Barrels)

	1989 Target	1985 Target
1979	92	92
1980	171	171
1981	252	337
1982	317	503
1983	376	668
1984	407	834
1985	501	1000
1986	628	1000
1987	752	1000
1988	871	1000
1989	1050	1000

based on filling the primary reserve and secondary reserve. The primary reserve goal is to have 550 million barrels of oil in storage by 1986.

The secondary reserve is planned to be an increment to the primary reserve and is to be filled in the four years following 1985. In this analysis, it is assumed that both primary and secondary Reserve targets would be met. Since the Strategic Petroleum Reserve Program is an on-going effort, the planned volumes in storage, the date of completion, and the fill rates may change. Thus, the description of the DOE oil acquisition purchases described here is to be considered a prototype program based on recent DOE planning.

The second alternative, represented by the SPR3 scenario, assumes that the size of the Reserve will be a billion barrels by 1985. To achieve such a target would require higher fill rates than does the DOE plan and would further increase the world demand for oil through 1985. This alternative reflects the possibility of increased interruptions in the near term as well as further into the decade and of accelerating the filling of the Reserve so that it could be used to reduce the vulnerability of the United States if an interruption occurs.

The last set of assumptions relate to OPEC's possible production response to our filling the Reserve. It is assumed in scenarios SPR7 and SPR11 that whenever oil is added to the Reserve, OPEC

decreases available production capacity by one million barrels per day. This assumes a strong OPEC retaliation and may be considered the worst case. It is consistent with news reports of Saudi Arabia's possible reaction to filling the Reserve. Moreover, it also can be used to reflect the possibility of any other production policies that reduce OPEC's planned production capacity by one million barrels per day.

In analyzing the economic effects of the Reserve purchases, the following were assumed to hold for each scenario:

1. There are no price controls on crude oil and petroleum products.

2. Monetary policy and fiscal policy are not changed between scenarios.

3. The Reserve purchases are paid for out of general revenue and are not offset by increases in taxes with the result that Reserve purchases add to the government's deficit. Other fiscal policy variables such as change in tax rates were not changed between scenarios.

The world oil price impacts are estimated for the period 1980 to 1990 for the 1989 Target scenario and 1980 to 1985 for the 1985 Target and OPEC retaliation scenarios. The period for which the economic impacts were estimated depends on the economic models' forecast horizons.

In summary, there are four scenarios in addition to the base case: the two different fill rates for the Reserve with and without OPEC retaliation. These scenarios offer a range of estimates of price and economic impacts, which will

distinguish the differential impacts of alternative fill rates for the Reserve and OPEC's response on world oil prices and economies.

3. WORLD OIL PRICE AND ECONOMIC EFFECTS OF THE DOE PLAN

This section discusses the impacts on the world oil market and the economy of the United States of filling the Reserve based on a recent DOE plan (1989 Target). This plan, or some variant of it, is under active consideration within DOE. The estimates of the price and economic effects should provide information of use to the policy analysts. Also, the results of this scenario provide a background to the sensitivity analysis presented later.

World Oil Market

Elements of the world oil market considered here are the world oil prices, consumption, production, and net imports. Forecasts of these four variables have been made on an annual basis through 1990 using EIA's OMS model. Basically, the OMS model forecasts the price of world crude oil and associated world supplies, given assumptions about available OPEC production capacity, national economic growth rates, and consumption and supply responses to world crude oil price changes.[1] The response parameters derive from EIA's IEES model and the Department of Energy/Policy and Evaluation's FOSSIL2 model.

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[1] The assumed available OPEC production capacity does not necessarily imply a given physical limit to the production of oil. Countries following conservative production policies may set limits to the amount of oil they are willing to supply which may be below the amount they can supply on a physical capacity basis.

Base Case. Table 3 shows the forecast of the world oil market without Reserve purchases.[2] This forecast is the world oil market base case from which the differential impacts of filling the Reserve under the scenarios are assessed. These differential impacts are then used as inputs into the economic impact analysis. The base case assumes an oil market that experiences rapid price increases in the first three years of the period under consideration (see Figure 2), primarily because of a decrease in available OPEC production capacity. The market is projected to respond to these higher prices by reducing consumption and increasing non-OPEC oil production leading to moderate price increases during the mid years of the decade. The decade ends with prices starting to rise more rapidly because continued world economic growth once again causes the growth in demand (at moderate prices) to exceed the growth in available supply. The slower rate of increase in world oil supply is the result of a peaking of production in OPEC and slow down in the rate of increase in non-OPEC production.

Findings. Table 4 shows the estimate of impacts of the Reserve-induced increases in world oil demand on the oil market. The initial impact of filling the Reserve is to increase U.S. net imports by an average of 0.1 million barrels per day above the base case for the period 1980-1984. World demand is flat over

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[2] Country and regions details of the forecasts are shown in the Tables in the Appendix.

Table 3. Estimates of World Oil Prices, Consumption, Production, and U.S. Imports Without Reserve Purchases

	Base Case (NOSPR)										
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
World Oil Price[a]	22.60	28.60	31.00	32.60	33.30	33.80	34.40	34.60	35.10	37.80	40.70
Consumption[b]											
United States	18.2	17.7	17.7	17.8	17.8	17.8	17.5	17.3	17.2	17.4	17.2
Total Free World	51.3	50.4	50.5	50.7	50.7	51.2	51.3	51.7	52.4	53.2	53.7
Production[b]											
United States	10.4	10.4	10.2	10.1	9.9	9.8	9.7	9.8	9.9	10.0	10.1
OPEC	30.2	28.1	28.5	28.8	29.0	29.4	29.5	29.2	29.2	29.2	29.0
Available OPEC Production Capacities[b,c]	30.2	28.1	28.5	28.8	29.2	29.5	29.9	29.7	29.5	29.2	29.0
Net U.S. Imports											
Total U.S.	7.8	7.3	7.5	7.8	7.9	8.0	7.8	7.5	7.3	7.4	7.2
SPR Purchases	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[a] In 1979 dollars for crude oil delivered to the United States.

[b] Million barrels per day.

[c] The available OPEC Production Capacities are assumed.

Details may not add to totals because of rounding.

Source: Derived using the Energy Information Administration's (EIA) Oil Market Simulation (OMS) model.

the same period for the rest of the decade. The Reserve purchases increase U.S. imports on the average by 0.3 million barrels a day and increase world demand on the average 0.2 percent above the base case. Relative to the size of the market the increase in world demand is small.

An examination of the estimated impacts indicates that there is hardly a discernible effect on consumption and production. The observed changes are well within the estimation error of the model used.

The world oil price in the 1989 Target case is expected to be above the baseline price throughout the decade. (See Figure 2). The size of the difference is related to how tight the oil market is in the base case. The world oil market is tight in 1980-81 and in 1988 and 1989. In these years, there is no spare, available production capacity in OPEC and the price of oil is $0.50 to $1.30 per barrel higher in the 1989 Target case than in the base case. The difference is smaller after 1981, falling to 10 cents in 1985. This represents both the slowing down of consumption, the increased non-OPEC production, and the existence of spare available OPEC production capacity after 1982. During this period, the Reserve purchases cut into the available OPEC spare capacity seen in the base case, but the price impact of the Reserve purchases becomes progressively smaller.

Figure 2.

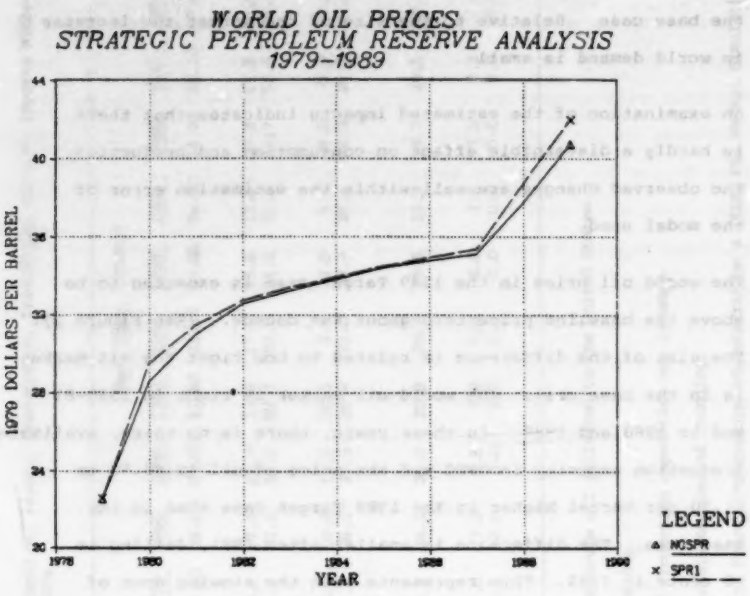
WORLD OIL PRICES
STRATEGIC PETROLEUM RESERVE ANALYSIS
1979-1989
1979 DOLLARS PER BARREL
YEAR
LEGEND
NOSPR
SPR1

Table 4. Estimates of World Oil Prices, Consumption, Production, and U.S. Imports With Reserve Purchase (1989 Target)

	1989 Target Plan (SPR1)										
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
World Oil Price[a]	22.60	29.50	31.50	32.70	33.40	34.00	34.50	34.90	35.40	38.80	42.00
Consumption[b]											
United States	18.2	17.9	17.9	17.9	17.9	17.8	17.7	17.6	17.5	17.6	17.6
Total Free World	51.3	50.4	50.5	50.7	50.8	51.1	51.4	51.9	52.6	53.2	53.8
Production[b]											
United States	10.4	10.4	10.2	10.1	9.9	9.8	9.7	9.8	9.9	10.0	10.1
OPEC	30.2	28.1	28.5	28.8	29.0	29.3	29.6	29.4	29.3	29.2	29.0
OPEC Capacity[b,c]	30.2	28.1	28.5	28.8	29.2	29.5	29.9	29.7	29.5	29.2	29.0
Net U.S. Imports[b]											
Total U.S.	7.8	7.4	7.6	7.9	8.0	8.0	8.0	7.8	7.6	7.6	7.5
SPR Purchases	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.4	0.3	0.3	0.5

[a] In 1979 dollars for crude delivered to the United States.

[b] Millions of barrels per day.

[c] OPEC Capacity for each year is assumed.

Details may not add to totals because of rounding.

Source: Derived using the Energy Information Administration's (EIA) Oil Market Simulation (OMS) model.

The central finding then is that there is a perceptible increase in world oil prices in 1980 and 1981 when the market is tight and a hardly discernible price change in the mid 1980s.

The Economic Effects

This section discusses the economic effects of filling the Reserve according to the 1989 Target plan. The emphasis is on the United States economy because the small increases in world oil prices result in small, barely discernible movement in the foreign economies.

The economic impacts on the United States were estimated by using the Annual and Industry Forecasting model of the Wharton Econometric Forecasting Associates, Inc. (WEFA). The estimates of economic effects derive from comparing a baseline projection with a projection reflecting the 1989 Target Plan's purchase of oil and the changes in the world oil prices. The numerical estimates of the economic impacts are determined by calculating the difference (percent difference) between the levels of the economic indicators of the base case and the disturbed case.

Base Case

The base case reflects the production, consumption, and oil imports when there is no purchase of oil for the Reserve. The base case is based on WEFA's September 1979 control forecast. This forecast was modified by using OMS's no Reserve purchase

(NOSPR) estimates for the United States oil imports and production and the world oil prices as inputs into the model. Since the September 1979 control forecast reflects a different economic environment such as a lower oil price path, other adjustments were made to this solution to represent higher world inflation rates, changes in exchange rates, and other modifications in the fiscal and monetary sectors to develop plausible projections of the economy.

It is assumed that there are no price controls on crude oil and petroleum products and no allocation or other forms of rationing are in operation.

A non-accomodating monetary policy is assumed in the base case. That is, the nominal rates of interest are assumed not to be completely elastic with respect to economic activity but respond to changes in the money supply. The same response pattern is used in the disturbed case. Fiscal policy is assumed to be the same in the base and disturbed cases. That is, fiscal policy levers such as changes in tax rates are not changed. These assumptions are made because it is not known what the monetary and fiscal authorities' response would be to the changes in economic activity.

The economic effects of filling the Reserve are estimated by comparing the baseline projection (NOSPR) with the 1989 Target Plan case. Table 5 shows the estimates for real Gross National

Product (GNP), inflation rates, and employment.[3] Real GNP is GNP adjusted for the rate of inflation and is measured in constant 1972 dollars.

The 1989 Target Plan projections derive from adjusting the base case using the new world oil price, oil imports, and production from the OMS projection for the 1989 Target plan. The Federal government sector is adjusted to take into account the purchase of oil.

The oil purchased for the Reserve is valued at the world oil prices. It is assumed that the Reserve purchases are financed out of the general revenue of the Federal government; no special taxes or fees are levied to pay for the Reserve. The intital effect of this assumption is to increase the Federal deficit by the value of the Reserve purchase.

The estimates show a negative impact on real GNP which averages 0.2 percent below the baseline projection for the 1980s. The range of variations is from less than 0.1 percent to 0.4 percent below the baseline real GNP projection. Given the error properties of the model and size of the economy, changes of this order of magnitude border on being negligible. The most that can be said is that the filling of the Reserve has a perceptible negative drag on the economy.

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[3] Details of the estimated economic effects on the United States are shown in the Tables in the Appendix.

Table 5. Estimates of the Effect on the U.S. of Filling Reserve on Gross National Product, Gross National Product Deflator, Consumer Prices and Unemployment, 1980-1989

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
					Billion of 1972 Dollars					
Gross National Product										
1989 Target (SPR1)	1396.3	1457.8	1484.5	1516.9	1552.3	1600.7	1666.2	1746.9	1830.9	1925.0
Base Case (NOSPR)	1399.9	1460.1	1486.8	1522.1	1556.5	1601.7	1670.8	1753.4	1838.9	1833.2
Difference	-3.6	-2.8	-2.3	-5.1	-4.3	-1.0	-4.6	-6.5	-8.0	-8.2
Percent Difference	-0.26	-0.19	-0.16	-0.34	-0.27	-0.06	-0.27	-0.37	-0.43	-0.42
					Level					
Gross National Product Deflator (1972 = 100.0)										
1989 Target	182.4	199.4	219.1	239.2	262.0	286.0	310.9	336.3	364.9	395.1
Base Case	182.0	198.9	218.3	238.1	260.3	284.2	308.8	333.8	361.6	391.1
Difference	0.4	0.5	0.8	1.2	1.8	1.8	2.1	2.5	3.3	3.9
Consumer Price Index (1967 = 100.0)										
1989 Target	246.1	272.1	300.0	327.9	359.0	390.9	424.2	457.8	498.1	540.7
Base Case	244.8	271.0	298.7	326.2	356.2	388.5	421.2	454.2	492.9	534.7
Difference	1.2	1.0	1.3	1.7	2.8	2.4	3.0	3.6	5.2	6.5
					Percent					
Unemployment										
1989 Target	8.44	8.39	8.82	8.98	8.93	8.47	7.35	5.84	4.49	3.48
Base Case	8.34	8.29	8.74	8.82	8.78	8.44	7.29	5.73	4.34	3.33
Difference	0.10	0.10	0.08	0.16	0.15	0.03	0.07	0.12	0.15	0.15

Source: Derived using WEFA's Annual and Industrial Forecasting model.

These small effects result from two factors. The first is that the differences in world oil prices between the base case and disturbed case are small. This means that the terms of trade effects on real income are not large. In fact, a simple calculation shows that the first order effect on real income is less than 0.1 percent and for most of the decade averages about 0.05 percent.[4] The greater effects shown in Table 5 are due to second order effects. Given the uncertainty surrounding any forecasts of the economy, the terms of trade effect is small.

Table 5 shows two measures of the inflation rate. The first is the implicit price deflator for GNP, which gives an economy-wide measure of inflation. The other is the Consumer Price Index, which gives a measure of the inflation rate facing consumers. Estimates of both measures show the effect of filling the Reserve under the 1989 Target as very small.

The unemployment rate estimates also show small increases reflecting the small drag on the economy. For reasons noted, the changes are negligible.

In summary, the estimate of the effects on the economy of filling the Reserve according to the 1989 Target as measured by these general indicators show that there is negative drag on the economy, but the numerical estimates of these impacts are negligible.

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[4] The first order effects of the terms of trade effect on real income can be approximated by multiplying the change in the terms of trade from the base by the ratio of nominal oil imports to nominal GNP. The terms of trade are measured as the ratio of the oil imports price index to the export price index. The ratio of nominal value of imports to nominal GNP is one indicator of the burden of oil imports to the economies.

There are limitations that need to be kept in mind in evaluating these results. One is that the WEFA model is a stand alone model in the sense that international feedbacks resulting from the international trade movements are not fully taken into account. The measured economic effects could be greater or smaller than those reported if the economies of the world are linked together through international trade flows. A second limitation is that this analysis does not yet take into account a possible OPEC response to filling the Reserve. A sensitivity analysis on such retaliation response will be discussed later in this paper.

4. SENSITIVITY ANALYSIS

The oil price and economic effects of filling the Reserve have so far assumed a fill rate implied by the 1989 Target Plan and the production and pricing policies of OPEC that were the same as the base case. The estimates of the sensitivity analysis presented in this section are based on a different Reserve plan and OPEC production policy.

The new Reserve plan is defined by the 1985 Target (SPR3) scenario. In this scenario it is assumed that one billion barrels of oil will be in storage by the end of 1985. This scenario is solely concerned with the effects of acquiring oil for storage for the hypothetical Reserve. Questions associated with accelerating the development of the storage capacity that would be needed to meet the 1985 Target are not considered.[1]

The OPEC retaliation scenarios (SPR7 and SPR11) assume that some members of OPEC will reduce their available production capacity by one million barrels per day if any oil is purchased for the Reserve. This reduction in available capacity

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[1] The issue of the difference in expected net benefits that may result from different Reserve sizes (1989 Target versus the 1985 Target) is not addressed in this paper. This paper provides estimates of the cost of acquiring oil for the Reserve of two different sizes through 1985, which is one element required to calculate the net benefits. For an analysis of this issue see EIA's Analysis Memorandum, Macroeconomic Effects of Petroleum Supply Interruption, Volume I, March 1979.

is assumed to not be offset by any increases in available capacity by other OPEC members. Thus the price increases estimated for this case should be viewed as a worst case in which the million barrels would be absorbed in the market place by decreases in demand brought about by higher oil prices. To the extent that slack capacity is available elsewhere, the price impacts shown here would be reduced.

World Oil Market

Tables 6 and 7 show the estimates of the effects on the world oil market for the three disturbed scenarios (SPR3, SPR7, and SPR11).[2] The forecast horizon of the estimates is 1985. This forecast horizon allows the measurement of the differential effects of having a planned Reserve of one billion barrels by 1985 instead of 500 million barrels, as is the case with the 1989 Target Plan.

World Oil Prices

The estimates of the world oil price for the three disturbed cases show prices above the base case through 1985. After the initial large increase in 1980, the price increases less rapidly causing the difference between the base case price and the disturbed cases to decrease (see Figure 3).

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[2] Country and regional details of the forecast are shown in the Tables in the Appendix.

Table 6. Estimates of World Oil Prices, Consumption, Production, and U.S. Imports With and Without the Reserve Purchases; Selected Years

	Base Case (NOSPR)			No OPEC Retaliation 1989 Target (SPR1)			OPEC Retaliation 1989 Target (SPR7)		
	1980	1983	1985	1980	1983	1985	1980	1983	1985
World Oil Price [a]	28.60	33.30	34.40	29.50	33.40	34.50	34.20	35.90	36.50
Consumption [b, c]									
United States	17.7	17.8	17.5	17.9	17.9	17.7	17.7	17.5	17.3
Total Free World	50.4	50.7	51.3	50.4	50.8	51.4	49.5	49.6	50.3
Production [b]									
United States	10.4	9.9	9.7	10.4	9.9	9.7	10.4	9.9	9.8
OPEC	28.1	29.0	29.5	28.1	29.0	29.6	27.1	27.6	28.1
OPEC Capacity [b]	28.1	29.2	29.9	28.1	29.2	29.9	27.1	28.2	28.9
Net U.S. Imports [b]									
SPR Purchases	0.0	0.0	0.0	0.2	0.2	0.3	0.2	0.2	0.3
Total U.S. c	7.3	7.9	7.8	7.4	8.0	8.0	7.2	7.6	7.5

[a] In 1979 dollars for crude oil delivered to the United States.

[b] Million barrels per day.

[c] Includes SPR purchases.

Details may not add to totals because of rounding.

Source: Derived using the Energy Information Administration's (EIA) Oil Market Simulation (OMS) model.

Table 6. Continued

	Base Case (NOSPR)			No OPEC Retalation 1985 Target (SPR3)			OPEC Retaliation 1985 Target (SPR11)		
	1980	1983	1985	1980	1983	1985	1980	1983	1985
World Oil Price [a]	28.60	33.30	34.40	29.50	34.20	35.30	34.20	36.50	37.30
Consumption [b, c]									
United States	17.7	17.8	17.5	17.8	18.1	17.8	17.7	17.8	17.4
Total Free World	50.4	50.7	51.3	50.4	50.7	51.3	49.5	49.7	50.2
Production [b]									
United States	10.4	9.9	9.7	10.4	9.9	9.8	10.4	9.9	9.8
OPEC	28.1	29.0	29.5	28.1	29.0	29.3	27.1	27.8	28.0
OPEC Capacity [b,c]	28.1	29.2	29.9	28.1	29.2	29.9	27.1	28.2	28.9
Net U.S. Imports [b]									
SPR Purchases	0.0	0.0	0.0	0.2	0.5	0.5	0.2	0.5	0.5
Total U.S. [d]	7.3	7.9	7.8	7.4	8.2	8.0	7.2	7.9	7.6

[a] In 1979 dollars for crude oil delivered to the United States.

[b] Million barrels per day.

[c] OPEC Capacity in each scenario is assumed.

[d] Includes SPR purchases.

Details may not add to totals because of rounding.

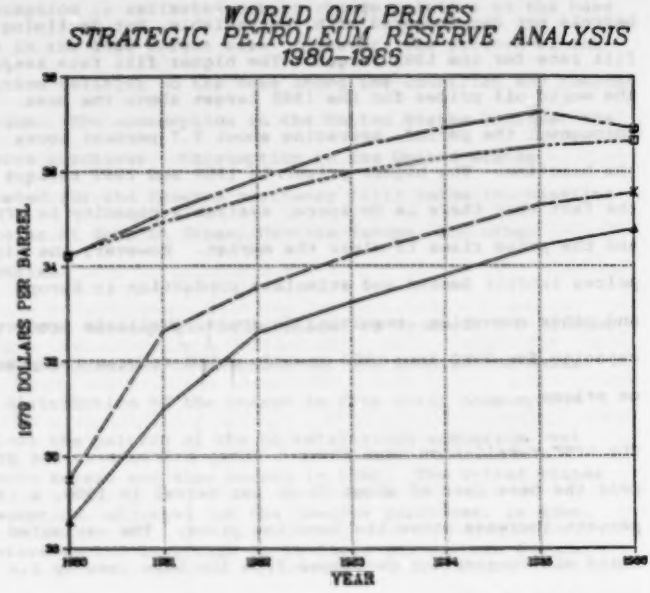
Source: Derived using the Energy Information Administration's (EIA) Oil Market Simulation (OMS) model.

Table 7. Strategic Petroleum Reserve Effects on Oil Consumption
(Percentage Difference from Base Case)

Country Group	No OPEC Retaliation 1985 Target (SPR3) 1980	1983	1985	With OPEC Retaliation 1989 Target (SPR7) 1980	1983	1985	1985 Target (SPR11) 1980	1983	1985
United States									
Including the Reserve	0.6	1.7	1.7	0.0	-1.7	-1.1	0.0	0.0	-0.6
Excluding the Reserve	-0.6	-1.1	-1.1	-1.1	-2.8	-2.9	-1.1	-2.8	-3.4
Canada	0.0	0.0	0.0	-5.3	-5.9	0.0	-5.3	-5.9	0.0
Japan	0.0	-1.7	-1.6	-1.8	-3.3	-3.2	-1.8	-5.0	-4.8
Western Europe	0.0	-0.8	-0.8	-1.4	-3.0	-2.4	-1.4	-3.8	-3.2
OPEC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Countries	0.0	-1.2	-1.1	-4.9	-2.3	-2.2	-4.9	-3.5	-2.2
Total Free World	0.0	0.0	0.0	-1.8	-2.2	-1.9	-1.8	-2.0	-2.1

Source: Based on forecasts derived using the EIA Oil Market Simulation (OMS) model.

Figure 3.



LEGEND

▲	NOSPR	BASE CASE
×	SPR3	1985 Target without Retaliation
□	SPR7	1989 Target with Retaliation
■	SPR11	1985 Target with Retaliation

The 1980 price increase for the 1985 and 1989 targets is the same, because the fill rate is the same for that year. After 1980, the 1985 Target fill rate is just under 500 thousand barrels per day compared with the variable, but declining fill rate for the 1989 Target. The higher fill rate keeps the world oil prices for the 1985 target above the base throughout the period, averaging about 2.7 percent above the baseline. The higher prices in 1981 and 1982 reflect the fact that there is no spare, available capacity in OPEC and the price rises to clear the market. However, the higher prices inhibit demand and stimulate production in Europe and other countries, resulting in spare, available production capacity for OPEC from 1983 onward, which reduces the pressure on prices.

The OPEC retaliation case shows a sharp increase in the price over the base case of about $5.60 per barrel in 1980, a 19.6 percent increase above the baseline price. The estimated world oil consumption decreases from the base case by 1.8 percent (Table 7). For the rest of the period, the rate of price increase slows down resulting in more than halving the price differential by 1985. The 1982 spare capacity in OPEC results in a slower rate of price increase.

The 1985 Target case prices are higher than those in the 1989 Target case in the retaliation scenario. This results from the tighter market conditions due to caused by the smaller spare capacity for the 1985 target case.

Table 7 shows the differential impacts on consumption by countries and regions for each of the disturbed cases. The differential effects vary across scenarios. Free world consumption is estimated not to change relative to the base case in the 1985 Target case. However, the pattern of consumption relative to the base among the countries and regions changes. The consumption in the United States includes the Reserve purchases. Consumption in the United States adjusted for the Reserve purchases falls below its baseline value as it does in Japan, Western Europe, and other countries.

Free World consumption is estimated to be about 2.0 percent below the baseline consumption for the retaliation cases. The distribution of the change in Free World consumption follows the pattern of the no retaliation scenarios, but is more severe and also occurs in 1980. The United States consumption, adjusted for the Reserve purchases, is down relative to the base case as is Japan and Western Europe.

The decrease in consumption among the countries relative to the base case is in response to the higher world oil prices induced by the Reserve purchases. The response differs among the countries because of the differences in the price and income elasticities, and the length of time it takes for each country to adjust to the higher

prices.[3] It is clear that the reduced vulnerability of the United States that results from having the Reserve is gained at the expense of reduced consumption in both the United States and elsewhere.

Economic Effects

The estimates of the economic effects presented in this section derive, as above, by comparing each of the disturbed cases (SPR3, SPR7, and SPR11) to the base case. In addition to the effects on the United States, rough estimates of the effects on the economies of other countries and regions are presented for the OPEC retaliation scenarios (SPR7 and SPR11). The estimates for other countries and world trade derive from a version of the WEFA/SRI World model developed for EIA. The results are indicative of the possible direction and magnitude of change of the economic indicators when the economies are linked together through international prices and trade flows. The limitations of the other countries estimates will be discussed below.

Findings for the United States

Table 8 shows the estimates of the effects of filling the Reserve for the three scenarios on real GNP, prices, and

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[3] For the price and income elasticites in the OECD countries, see "Energy Demand in the OECD Countries," by Derriel B. Cato, Technical Report, United States Department of Energy, Energy Information Administration, forthcoming.

Table 8. Estimates of Economic Impacts on the U.S. Economy

	No OPEC Retaliation 1985 Target (SPR3)					
	1980	1981	1982	1983	1984	1985
Real GNP [a]	-0.2	-0.8	-0.4	-0.7	-0.9	-0.3
Inflation Rates [b]						
Gross National Product Price Deflator	0.3	1.4	1.8	2.9	4.2	5.0
Consumer Price Index	0.8	3.1	3.3	4.7	6.7	7.0
Unemployment [c]	0.1	0.4	0.3	0.4	0.5	0.2

	OPEC Retaliation 1989 Target (SPR7)					
	1980	1981	1982	1983	1984	1985
Real GNP [a]	-0.9	-1.1	-1.0	-1.2	-0.5	-0.1
Inflation Rates [b]						
Gross National Product Price Deflator	2.1	3.2	4.8	6.7	8.7	9.8
Consumer Price Index	5.0	5.7	7.3	9.5	11.9	12.4
Unemployment [c]	0.4	0.6	0.7	0.8	0.5	0.1

	OPEC Retaliation 1985 Target (SPR11)					
	1980	1981	1982	1983	1984	1985
Real GNP [a]	-0.9	-1.3	-0.7	-1.3	-0.7	-0.1
Inflation Rates [b]						
Gross National Product Price Deflator	2.1	3.6	5.4	7.7	10.3	12.0
Consumer Price Index	5.0	6.7	8.5	11.2	14.6	15.6
Unemployment [c]	0.4	0.7	0.6	0.8	0.5	0.1

[a] Percent difference from the base case GNP in 1972 dollars.

[b] Difference from base case levels of price indexes.

[c] Percentage point difference from base case unemployment rate.

Source: Derived from the WEFA's Annual and Industry Forecasting model.

unemployment.[4] In contrast to the 1989 Target Plan scenario, the effects on these variables are consistently greater and cannot be considered negligible. The response pattern reflects the path of world oil prices relative to the base case and the dynamic adjustment of the economy.

Real Output. For the 1985 Target Plan without retaliation (SPR3) for the years 1980 to 1985, real GNP is on the average 0.6 percent below the baseline real GNP (See Table 8) as compared with the average of 0.2 percent for 1989 Target Plan without retaliation (SPR1). Cyclical variations are evident, reflecting changes in inventories, residential investment, and the diminishing size of the oil price shock to the economy. Real personal consumption, other components of real fixed investment, and real net exports of goods and services are below their baselines through 1985 and show less cyclical variations.

The effects on real GNP for the OPEC retaliation scenarios (SPR7 and SPR11) average about 0.8 percent below the baseline real GNP. The 1985 Target Plan's loss in real GNP is slightly greater than the 1989 Target Plan. This reflects the higher oil price path for the 1985 Target Plan. Cyclical variations are again evident. Movement in residential investment accounts for major cyclical variations, with some support

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[4] Details of the estimated economic effects on the United States are shown in the Tables in the Appendix.

from inventory changes. Real consumption, other fixed investment, and net export of goods and services are below their baseline values.

Analysis

The estimates of the economic indicators for the sensitivity cases thus show larger impacts than those estimated for the 1989 Target Plan (with no OPEC retaliation). There are more significant movements in the economy reflecting the dynamic adjustment of the economy to the oil price shocks.

The terms of trade effect (the increase in the price of oil relative to export prices) of the oil price shocks becomes smaller each year after 1980. The differential size of the price shock diminishes relative to the base case (see Figure 3). The dynamic adjustment to these price shocks generates the movement of real GNP from year to year.

Residential investment accounts for most of the movement of real GNP. Because of higher final goods prices, reduced real disposable income, and the increased cost of housing, the actual stock of housing falls below the desired level of the stock, which is determined by long-run demographic factors. The consequence of this difference between the actual and desired level is that new housing construction starts to increase adding a positive increment to real GNP. The greater the difference between the desired and the actual stock levels, the greater the adjustment and increment to real GNP.

The movement of residential investment points to the fact that real output is a flow; that is, its dimensions are dollars per year. When the economy is disturbed by oil prices which vary from year to year, then real output can vary from year to year even possibly rising above the baseline real output in some year.

What is important is the cummulative loss in real output over the period considered. Output foregone cannot be made up. Further, as is true in these scenarios, fixed investment excluding housing is consistently below its baseline implying lower real capital stock for the future. This means that the potential growth of the economy could be reduced.

A limitation of the United States estimates is that they derive from a stand alone domestic model. Movements in the foreign trade variables are essentially derived from assumptions about economic activity in other countries. They are not linked to other economies through a system of linked flows of international prices and goods. The estimates could be greater or smaller if linkage equations could be taken into account.

Another limitation is that the estimates are derived relative to a base case. Since the model is non-linear, the relative differences between the disturbed case and the base case could vary if a different base case were selected.

Findings for Other Countries

Tables 9 to 11 show the estimates of the effect of filling the Reserve with retaliation by OPEC on real gross domestic product (GDP) and world trade for the 1980 to 1985 period. The estimates are limited to the OPEC retaliation scenarios, because the relatively smaller oil price increases in the non-retaliation scenarios generate movements in real income in the world economies that are barely discernible. The relatively larger oil price shock of the retaliation results in movements among the major economies that are consistent with what would be expected given the size of the oil import bills and the trade linkages.

These estimates show that there could be a reduction in real GDP for the OECD countries, but the distribution of the loss could vary from country to country.

For the OECD countries, the estimated real GDP is below the baseline projection for the period 1980-1984. For 1985, the real GDP is 0.1 percent above the baseline for the 1989 Target case (See Table 9). This finding emphasises the point made earlier about movements in real GDP in response to oil price shocks as can be seen by the different results among the countries. Of the OECD economies, it is essentially West Germany, Italy, and the United Kingdom that contribute to this result. The results for Italy, as shown in Table 11, are better than expected, given the importance of oil imports relative to GDP. However, Italy's exports remain fairly strong

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Table 9. Estimates of Impacts on the Organization for Economic Co-Operation and Development (OECD) Gross Domestic Product, 1980 - 1985

Year	Level[a] Base Case	Percentage Difference from Base Case With OPEC Retaliation 1989 Target	1985 Target
1980	2932.7	-0.1	-0.1
1981	3015.4	-0.1	-0.3
1982	3096.0	-0.2	-0.4
1983	3180.0	-0.4	-0.6
1984	3261.7	-0.2	-0.3
1985	3360.5	0.1	-0.1

[a] Measured in billions of 1970 United States dollars and 1970 exchange rates.

Table 10. Estimates of Impacts on the European Economic Community (EEC) Gross Domestic Product, 1980 - 1985

Year	Level[a]	Percentage Difference from Base Case	
		With OPEC Retaliation	
	Base Case	1989 Target	1985 Target
1980	822.6	-0.0	-0.0
1981	835.6	0.3	0.3
1982	853.6	0.1	0.1
1983	873.9	-0.3	-0.2
1984	893.9	-0.3	-0.3
1985	915.1	0.5	0.5

[a] Measured in billions of 1970 United States dollars and 1970 exchange rates.

Table 11. Estimates of Impacts on Gross Domestic Product in Selected Countries for Selected Years

Country and Year	Level[a] Base Case	Percentage Difference from Base Case With OPEC Retaliation 1989 Target	1985 Target
Canada			
1980	134.7	0.4	0.4
1983	147.0	-0.6	-0.7
1985	156.8	-0.8	-0.8
Japan			
1980	116.4	-0.4	-0.4
1983	126.3	-0.7	-0.7
1985	137.5	-0.6	-0.6
France			
1980	1119.8	-0.4	-0.4
1983	1162.0	-1.2	-1.2
1985	1222.4	-0.2	-0.2
West Germany			
1980	900.4	-0.3	-0.3
1983	965.1	0.2	0.2
1985	1001.6	1.5	1.5
Italy			
1980	76.5	-0.0	-0.0
1983	82.4	-0.5	-0.5
1985	87.0	0.1	0.1
United Kingdom			
1980	61.6	0.6	0.6
1983	63.6	0.6	0.6
1985	66.1	0.9	0.9

[a] Measured in billions of 1970 local currency units.

during this period which is one possible reason for its better showing.

The United Kingdom estimates are not surprising given the fact it will be an oil exporter during this period, and that the terms of trade have shifted in its favor because of the oil price increase.

West Germany's estimates reflect a strong export sector. They also reflect the fact that West Germany's merchandise exports to OPEC have recently been approximately equal to its imports from OPEC. For instance, in the first quarter of 1979, West Germany exported $2.5 billion of merchandise to the oil exporting countries and imported $2.8 billion from them.[5] Since the trade shares remain constant over the forecast period, this means that West Germany's loss in real income resulting from higher oil prices could be mostly offset by higher exports to OPEC.

Japan's estimates are consistent with its dependence on oil imports for its energy requirements. Its real GDP is consistently below its baseline real GDP over the forecast horizon. The estimates also reflect the effect of trade linkage on the economy. Part of the real GDP loss generated by the oil price increase is offset by reduced non-oil imports and increased exports.

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[5] International Monetary Fund, "Direction of Trade," August 1979.

The estimates of the effect on world merchandise trade are shown in Tables 12 to 14. The estimates show that world merchandise exports are below the baseline exports for the 1981-85 period and have a bowl-shaped pattern, but are above the baseline for 1980. This holds for the components of merchandise exports, primary and manufactured goods. The 1980 results are due to a combination of several factors. One is that there is no significant change in OECD's real GDP in 1980 which prevents the 1980 demand for imports from falling in the industrial countries. Another contributing factor is that part of the increase in export earnings in OPEC and other developing countries resulting from the higher oil prices are used in 1980 to purchase merchandise imports from the industrial countries. A third contributing factor is that it takes time for merchandise trade to adjust to the oil price shock.

Trade in primary goods exports, which includes oil, falls below the baseline for the rest of the forecast period for both the 1985 and 1989 Target. There is a greater impact on primary goods exports in the 1989 Target case than in the 1985 Target case, causing higher nominal exports in the 1985 Target case to generate greater demand for primary goods, except in the developing countries. Given the linkage effects, this raises non-oil primary goods exports.

Table 12. Estimates of Impacts on Total World Merchandise Exports, 1979 - 1985 a

Year	Level [b] Base Case	Percentage Difference from Base Case With OPEC Retaliation 1989 Target	1985 Target
1980	567.8	0.4	0.4
1981	588.3	-0.3	-0.2
1982	608.5	-0.3	-0.3
1983	627.2	-0.8	-0.8
1984	644.0	-0.9	-0.9
1985	664.0	-0.3	-0.4

[a] Includes the Centrally Planned Economies.

[b] Measured in billions of 1970 United States dollars.

Table 13. Estimates of Impacts on World Primary Goods Merchandise Exports, 1979 - 1989 a

Year	Level b Base Case	Percentage Difference from Base Case With OPEC Retaliation 1989 Target	1985 Target
1980	161.2	1.0	1.0
1981	168.2	-0.6	-0.2
1982	171.7	-0.5	-0.1
1983	175.2	-0.6	-0.3
1984	178.7	-0.8	-0.4
1985	183.1	-0.3	-0.1

a Includes the Centrally Planned Economies.

b Measured in billions of 1970 United States dollars.

Table 14. Estimates of Impacts on World Manufactured Goods Merchandise Exports, 1979 - 1989 [a]

Year	Level [b] Base Case	Percentage Difference from Base Case With OPEC Retaliation 1989 Target	1985 Target
1980	406.6	0.2	0.2
1981	420.1	-0.1	-0.2
1982	436.9	-0.3	-0.4
1983	452.0	-0.9	-1.0
1984	465.4	-1.0	-1.1
1985	481.0	-0.3	-0.5

[a] Includes Centrally Planned Economies

[b] Measured in billions of 1970 United States dollars.

The world exports in manufactured goods are below the baseline for the period 1981 to 1985. The rise in 1980 is the result of the increase in developing countries' imports of merchandise goods. After 1980, the slow growth of the major industrial countries results in a decline in the demand for manufactured goods and a further slowing down of economic activity in the world. Since total world exports must equal total world imports, this lower level of trade reflects the lower growth in the world economy.

In summary, the estimates of the effects of filling the Reserve under the assumptions of the three sensitivity scenarios show that an accelerated fill rate will have a measurable effect on the U.S. economy. The effect on the world economies are difficult to evaluate. Because of the relative terms of trade effects, the impact of the fill rate will be distributed differently among the world economies.

A possible OPEC retaliation manifested in the reduction of available production capacity during the filling of the Reserve would cause an initial, large world oil price increase. But because consumption declines and non-OPEC production increases, there would be a moderation of price increases for the rest of the period relative to the baseline projection.

The economic impact on the United States and other economies could result in the loss of real output of as much as 0.6 to 0.8 percent below the baseline. The effect on real output is unevenly distributed among the countries. Some countries, such as West Germany and the United Kingdom, are not greatly affected, whereas others, such as Japan, are most definitely affected by OPEC retaliation.

APPENDIX

This Appendix contains the computer printouts of the Oil Market Simulation (OMS) model and selected variables of the Annual and Industry model of WEFA for each scenario.

The OMS model printouts are given first. Information is reported for world oil prices, oil production, consumption, and net imports by selected countries and regions.

The Annual WEFA model printouts compare selected economic indicators of each disturbed scenario with the base case. Table A-1 gives the comparison with selected economic indicators. Table A-2 shows the components of gross national product in constant 1972 dollars.

	Scenario Names
NOSPR:	Base Case: No Reserve Purchase
SPR1:	1989 Target Plan
SPR3:	1985 Target Plan
SPR7:	1989 Target with OPEC Retaliation
SPR11:	1985 Target with OPEC Retaliation

OIL MARKET SIMULATION MODEL

** OIL MARKET FORECAST **

SCENARIO: NOSPR DATE OF SIMULATION: 11/27/79

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
WORLD OIL PRICE																	
1979 CIF $	22.58	28.58	30.99	32.59	33.25	33.82	34.43	34.80	35.12	37.76	40.72	43.80	44.80	45.39	46.06	46.85	48.96
CONSUMPTION (MMB/D)																	
UNITED STATES	18.2	17.7	17.7	17.8	17.8	17.8	17.5	17.3	17.2	17.4	17.2	17.1	16.8	16.6	16.3	16.2	16.0
CANADA	2.0	1.9	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8
JAPAN	5.4	5.5	5.7	5.8	6.0	6.1	6.3	6.1	6.0	6.0	5.9	5.8	6.0	6.2	6.5	6.7	7.0
WESTERN EUROPE	14.9	14.5	14.1	13.7	13.3	13.0	12.6	12.6	12.7	12.8	12.9	12.9	13.1	13.2	13.4	13.5	13.7
OPEC	2.3	2.5	2.8	3.1	3.4	3.8	4.2	4.7	4.7	5.0	5.3	5.6	5.9	6.3	6.6	7.0	7.4
OTHER COUNTRIES	8.1	8.2	8.3	8.4	8.6	8.8	9.1	9.6	10.1	10.4	10.8	11.1	11.6	12.2	12.8	13.4	13.9
TOTAL FREE WORLD	51.3	50.4	50.5	50.7	50.7	51.2	51.3	51.7	52.4	53.2	53.7	54.2	55.1	56.1	57.3	58.6	59.8
PRODUCTION (MMB/D)																	
UNITED STATES	10.4	10.4	10.2	10.1	9.9	9.8	9.7	9.8	9.9	10.0	10.1	10.1	10.3	10.5	10.7	10.9	11.1
CANADA	1.7	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.6	1.7	1.7	1.8	1.9	1.9	2.0	2.1	2.2
WESTERN EUROPE	2.3	2.9	3.0	3.1	3.1	3.2	3.3	3.5	3.6	3.7	3.9	4.0	4.0	4.0	3.9	3.9	3.8
OPEC	30.2	28.1	28.5	28.8	29.0	29.4	29.5	29.2	29.2	29.2	29.0	28.8	28.6	28.6	28.7	28.9	28.9
OTHER COUNTRIES	5.9	6.4	6.8	7.2	7.7	8.2	8.8	9.2	9.6	10.0	10.5	11.0	11.7	12.6	13.4	14.3	15.3
CPE NET EXPORTS	0.8	0.8	0.3	-0.1	-0.6	-1.0	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
TOTAL FREE WORLD	51.3	50.4	50.5	50.7	50.7	51.2	51.3	51.7	52.4	53.2	53.7	54.2	55.1	56.1	57.3	58.6	59.8
NET UNITED STATES IMPORTS (MMB/D)																	
50 STATE AREA	7.6	7.0	7.2	7.6	7.5	7.6	7.6	7.1	6.9	7.0	6.8	6.6	6.1	5.6	5.1	4.8	4.6
SPR PURCHASES	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
U. S. TERRITORIES	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
TOTAL UNITED STATES	7.8	7.3	7.5	7.9	7.9	8.0	7.8	7.5	7.3	7.4	7.2	7.0	6.5	6.0	5.6	5.2	4.9

OIL MARKET SIMULATION MODEL

** OIL MARKET FORECAST (CONTINUED) **

SCENARIO: HOSPR DATE OF SIMULATION: 11/27/79

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
WORLD OIL PRICE																	
1979 CIF $	22.98	28.98	30.99	32.54	33.29	33.62	34.43	34.80	35.12	37.76	40.72	43.80	46.99	49.39	48.88	48.81	48.96
NET IMPORTS (MMB/D)																	
UNITED STATES	7.8	7.3	7.5	7.8	7.9	8.0	7.8	7.5	7.3	7.4	7.2	7.0	6.5	6.0	5.6	5.2	4.9
CANADA	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	-0.0	-0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.3
JAPAN	5.8	5.5	5.7	5.8	5.9	6.1	6.3	6.1	6.0	5.9	5.8	5.8	6.0	6.0	6.0	6.1	6.0
WESTERN EUROPE	12.6	11.8	11.2	10.7	10.2	9.7	9.3	9.2	9.1	9.0	9.0	8.9	9.1	9.2	9.4	9.7	9.9
OPEC	-27.9	-25.6	-25.7	-25.7	-25.6	-25.7	-25.3	-24.8	-24.5	-24.3	-23.8	-23.2	-22.7	-22.4	-22.1	-21.9	-21.5
OTHER COUNTRIES	2.3	1.9	1.5	1.2	0.9	0.7	0.3	0.4	0.5	0.4	0.3	0.2	-0.1	-0.4	-0.6	-0.9	-1.4
TOTAL FREE WORLD	0.8	0.8	0.3	-0.1	-0.6	-1.0	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
IMPORT DEPENDENCE (FRACTION)																	
UNITED STATES	0.43	0.41	0.42	0.44	0.44	0.45	0.44	0.43	0.43	0.42	0.42	0.41	0.39	0.36	0.34	0.32	0.30
CANADA	0.14	0.08	0.09	0.08	0.08	0.08	0.08	0.05	0.02	-.00	-.03	-.06	-.09	-.12	-.14	-.17	-.19
JAPAN	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
WESTERN EUROPE	0.84	0.80	0.79	0.78	0.76	0.75	0.74	0.73	0.72	0.71	0.70	0.69	0.69	0.70	0.71	0.71	0.72
OTHER COUNTRIES	0.28	0.23	0.18	0.14	0.11	0.07	0.04	0.04	0.05	0.04	0.03	0.02	-.01	-.03	-.05	-.07	-.10

OIL MARKET SIMULATION MODEL

** OIL MARKET FORECAST **

SCENARIO: SPR1 DATE OF SIMULATION: 11/27/79

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
WORLD OIL PRICE																	
1979 DEC $	28.50	29.50	31.08	32.73	33.40	33.96	34.50	34.90	35.38	35.75	41.95	42.81	43.70	44.32	45.46	47.31	49.15
CONSUMPTION (MMB/D)																	
UNITED STATES	18.2	17.9	17.8	17.9	17.9	17.8	17.7	17.6	17.5	17.6	17.6	17.1	16.8	16.6	16.4	16.2	16.0
CANADA	2.0	1.9	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.8
JAPAN	5.8	5.5	5.7	5.6	5.9	6.1	6.3	6.1	6.0	5.9	5.8	6.0	6.2	6.5	6.7	7.0	7.0
WESTERN EUROPE	10.9	10.5	10.1	10.7	11.2	12.9	12.6	12.6	12.7	12.7	12.8	12.9	13.1	13.2	13.4	13.6	13.7
OPEC	2.3	2.5	2.8	3.1	3.4	5.8	6.2	6.6	6.7	5.0	5.3	5.6	5.9	6.3	6.6	7.0	7.4
OTHER COUNTRIES	8.1	8.2	8.3	8.4	8.6	8.8	9.1	9.6	10.1	10.4	10.7	11.2	11.7	12.3	12.8	13.3	13.9
TOTAL FREE WORLD	51.3	50.4	50.5	50.7	50.8	51.1	51.4	51.9	52.6	53.2	53.8	54.4	55.2	56.3	57.5	58.6	59.8
PRODUCTION (MMB/D)																	
UNITED STATES	10.6	10.6	10.2	10.1	9.9	9.8	9.7	9.8	9.9	10.0	10.1	10.1	10.3	10.5	10.7	10.9	11.1
CANADA	1.7	1.7	1.7	1.6	1.6	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.9	1.9	2.0	2.1	2.2
WESTERN EUROPE	2.3	2.9	3.0	3.1	3.1	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.0	4.0	3.9	3.9	3.8
OPEC	30.2	28.1	28.5	28.8	29.0	29.3	29.4	29.6	29.3	29.2	29.0	28.7	28.7	28.8	28.9	28.9	28.9
OTHER COUNTRIES	5.9	6.8	6.8	7.2	7.7	8.2	8.5	8.2	9.6	10.1	10.6	11.0	11.6	12.6	13.6	14.3	15.3
OPE NET EXPORTS	0.6	0.5	0.3	-0.1	-0.6	-1.0	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
TOTAL FREE WORLD	51.3	50.4	50.5	50.7	50.8	51.1	51.4	51.9	52.6	53.2	53.8	54.2	55.2	56.3	57.5	58.6	59.8
NET UNITED STATES IMPORTS (MMB/D)																	
SO STATE AREA	7.6	6.9	7.1	7.0	7.5	7.6	7.8	7.3	6.9	6.9	6.6	6.5	6.0	5.6	5.2	4.8	4.6
SPR PURCHASES	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.6	0.3	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0
U. S. TERRITORIES	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
TOTAL UNITED STATES	7.6	7.6	7.6	7.9	8.0	8.0	8.0	7.8	7.6	7.6	7.5	6.9	6.5	6.0	5.7	5.3	4.9

OIL MARKET SIMULATION MODEL

** OIL MARKET FORECAST (CONTINUED) **

SCENARIO: BPR1 DATE OF SIMULATION: 11/27/79

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
WORLD OIL PRICE																	
1979 DOLLARS	22.50	29.50	31.48	32.73	33.40	33.96	34.50	34.98	35.38	38.75	41.95	42.81	43.58	44.32	45.06	47.31	49.15
NET IMPORTS (MMB/D)																	
UNITED STATES	7.8	7.6	7.6	7.9	8.0	8.0	8.0	7.8	7.6	7.6	7.5	6.9	6.5	6.0	5.7	5.3	4.9
CANADA	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	-0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3
JAPAN	5.6	5.5	5.7	5.8	5.9	6.1	6.2	6.1	6.0	5.9	5.8	5.8	6.0	6.2	6.5	6.7	7.0
WESTERN EUROPE	12.6	11.5	11.1	10.6	10.1	9.7	9.5	9.1	9.1	9.0	8.9	8.9	9.0	9.3	9.5	9.7	9.9
OPEC	-27.9	-25.6	-25.7	-25.7	-25.6	-25.6	-25.6	-24.9	-24.7	-24.3	-23.6	-23.1	-22.8	-22.5	-22.2	-21.9	-21.5
OTHER COUNTRIES	2.3	1.8	1.5	1.2	0.9	0.6	0.3	0.0	0.5	0.3	0.1	0.2	-0.1	-0.3	-0.6	-1.0	-1.4
TOTAL FREE WORLD	0.8	0.8	0.3	-0.1	-0.6	-1.0	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
IMPORT DEPENDENCE (FRACTION)																	
UNITED STATES	0.43	0.42	0.43	0.44	0.45	0.45	0.45	0.44	0.43	0.43	0.43	0.41	0.38	0.36	0.34	0.33	0.31
CANADA	0.16	0.08	0.08	0.08	0.07	0.07	0.08	0.06	0.02	-0.01	-0.04	-0.07	-0.09	-0.12	-0.14	-0.16	-0.19
JAPAN	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
WESTERN EUROPE	0.84	0.80	0.79	0.78	0.76	0.75	0.76	0.73	0.72	0.71	0.69	0.69	0.69	0.70	0.71	0.71	0.72
OTHER COUNTRIES	0.26	0.22	0.18	0.14	0.11	0.07	0.03	0.04	0.05	0.03	0.01	0.02	-.00	-.02	-.05	-.07	-.10

OIL MARKET SIMULATION MODEL

** OIL MARKET PUBLICATION **

SCENARIO: SPR3 DATE OF SIMULATION: 11/20/79

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
WORLD OIL PRICE																	
1979 CIF $	22.58	29.49	32.63	33.55	34.23	34.76	35.30	35.56	35.56	35.69	35.81	43.29	44.17	44.92	45.68	47.49	49.11
CONSUMPTION (MMB/D)																	
UNITED STATES	18.2	17.8	18.1	18.2	18.1	18.1	17.8	17.2	17.1	17.3	17.2	17.1	16.8	16.6	16.8	16.2	16.1
CANADA	2.0	1.9	1.8	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.8
JAPAN	5.8	5.5	5.7	5.8	5.9	6.0	6.2	6.1	6.0	5.9	5.9	5.8	6.0	6.2	6.5	6.7	7.0
WESTERN EUROPE	14.9	14.5	14.0	13.6	13.2	12.8	12.5	12.5	12.6	12.7	12.9	13.0	13.1	13.2	13.4	13.6	13.7
OPEC	2.3	2.5	2.8	3.1	3.4	3.8	4.2	4.4	4.7	5.0	5.3	5.6	5.9	6.3	6.6	7.0	7.4
OTHER COUNTRIES	8.1	8.2	8.2	8.3	8.5	8.6	9.0	9.5	10.1	10.6	10.9	11.1	11.6	12.2	12.8	13.3	13.9
TOTAL FREE WORLD	51.3	50.4	50.5	50.7	50.7	51.1	51.3	51.3	52.0	53.2	53.7	54.2	55.2	56.2	57.6	58.6	59.8
PRODUCTION (MMB/D)																	
UNITED STATES	10.4	10.4	10.2	10.1	9.9	9.8	9.8	9.9	9.9	10.0	10.1	10.1	10.2	10.5	10.7	10.9	11.1
CANADA	1.7	1.7	1.7	1.6	1.6	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	2.0	2.1	2.2
WESTERN EUROPE	2.3	2.9	3.0	3.1	3.1	3.2	3.3	3.5	3.6	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.0
OPEC	34.2	28.1	28.5	28.8	29.0	29.3	29.3	28.6	28.7	29.0	29.0	28.8	28.7	28.7	28.8	28.8	28.9
OTHER COUNTRIES	5.9	6.4	6.8	7.3	7.7	8.3	8.8	9.3	9.7	10.1	10.5	11.0	11.6	12.6	13.4	14.3	15.3
CPE NET EXPORTS	0.8	0.8	0.3	-0.1	-0.8	-1.0	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
TOTAL FREE WORLD	51.3	50.4	50.5	50.7	50.7	51.1	51.3	51.3	52.0	53.2	53.7	54.2	55.2	56.2	57.6	58.6	59.8
NET UNITED STATES IMPORTS (MMB/D)																	
50 STATE AREA	7.4	6.9	7.1	7.3	7.4	7.4	7.2	6.9	6.8	6.9	6.7	6.5	6.6	5.6	5.6	4.8	4.4
SPR PURCHASES	0.1	0.2	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
U. S. TERRITORIES	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
TOTAL UNITED STATES	7.8	7.4	7.8	8.1	8.2	8.3	8.0	7.3	7.2	7.3	7.1	6.9	6.5	6.0	5.9	5.4	4.9

OIL MARKET SIMULATION MODEL

** OIL MARKET FORECAST (CONTINUED) **

SCENARIO: SPR3 DATE OF SIMULATION: 11/20/79

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
WORLD OIL PRICE																	
1979 CIF $	22.58	29.69	32.63	33.55	34.23	34.78	35.30	35.56	35.54	35.69	35.61	43.29	44.17	44.92	45.68	47.49	49.11
NET IMPORTS (MMB/D)																	
UNITED STATES	7.8	7.4	7.8	8.1	8.2	8.3	8.4	7.8	7.8	7.8	7.1	6.9	6.5	6.0	5.8	5.2	5.9
CANADA	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	-0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3
JAPAN	5.6	5.5	5.6	5.8	5.9	6.0	6.2	6.0	6.0	5.9	5.9	5.8	6.0	6.2	6.5	6.7	7.0
WESTERN EUROPE	12.6	11.5	11.8	10.5	10.0	9.6	9.2	9.0	9.0	9.0	8.9	9.1	9.3	9.5	9.7	9.9	9.9
OPEC	-27.9	-25.6	-25.7	-25.7	-25.6	-25.6	-25.2	-24.3	-24.0	-24.2	-23.8	-23.2	-22.6	-22.4	-22.4	-21.9	-21.5
OTHER COUNTRIES	2.3	1.8	1.8	1.1	0.8	0.5	0.2	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.5	-0.6	-0.8
TOTAL FREE WORLD	0.8	0.8	0.3	-0.1	-0.6	-1.0	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
IMPORT DEPENDENCE (FRACTION)																	
UNITED STATES	0.43	0.42	0.43	0.45	0.45	0.46	0.45	0.43	0.42	0.42	0.41	0.41	0.38	0.36	0.34	0.32	0.30
CANADA	0.14	0.08	0.08	0.07	0.06	0.06	0.06	0.03	0.00	-0.01	-0.02	-0.06	-0.08	-0.12	-0.14	-0.16	-0.19
JAPAN	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
WESTERN EUROPE	0.84	0.80	0.79	0.77	0.74	0.75	0.73	0.72	0.71	0.71	0.70	0.69	0.69	0.70	0.71	0.71	0.72
OTHER COUNTRIES	0.28	0.22	0.17	0.13	0.10	0.09	0.02	0.03	0.04	0.05	0.03	0.02	-0.01	-0.03	-0.05	-0.07	-0.10

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OIL MARKET SIMULATION MODEL

** OIL MARKET FORECAST **

SCENARIO: SPR 7 DATE OF SIMULATION: 11/27/79

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
WORLD OIL PRICE																	
1979 CIF $	22.58	34.23	34.93	35.48	35.98	36.28	36.53	36.65	36.79	37.94	42.21	42.21	42.32	42.60	43.72	46.42	48.65
CONSUMPTION (MMB/D)																	
UNITED STATES	18.2	17.7	17.6	17.6	17.5	17.5	17.3	17.2	17.1	17.3	17.3	16.8	16.6	16.5	16.4	16.2	16.0
CANADA	2.0	1.8	1.8	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.8
JAPAN	5.8	5.6	5.5	5.7	5.8	5.9	6.1	5.9	5.9	5.8	5.7	5.7	6.0	6.2	6.5	6.8	7.0
WESTERN EUROPE	14.9	14.3	13.8	13.5	12.9	12.5	12.3	12.3	12.4	12.5	12.6	12.8	13.0	13.2	13.4	13.6	13.7
OPEC	8.3	8.5	8.8	9.1	9.4	9.8	9.2	9.4	9.7	9.0	9.3	9.6	9.9	9.3	8.6	7.0	7.4
OTHER COUNTRIES	8.1	7.8	8.0	8.2	8.4	8.6	8.9	9.4	10.0	10.4	10.6	11.2	11.8	12.4	13.0	13.4	13.9
TOTAL FREE WORLD	51.3	49.5	49.5	49.6	49.6	49.9	50.3	50.8	51.6	52.6	53.2	53.8	55.0	56.3	57.7	58.8	60.0
PRODUCTION (MMB/D)																	
UNITED STATES	10.4	10.4	10.3	10.1	9.9	9.9	9.8	9.9	10.0	10.1	10.1	10.2	10.4	10.6	10.8	10.9	11.1
CANADA	1.7	1.7	1.7	1.6	1.6	1.6	1.5	1.6	1.6	1.7	1.8	1.9	2.0	2.0	2.1	2.2	2.2
WESTERN EUROPE	2.3	3.0	3.6	3.1	3.2	3.3	3.4	3.5	3.7	3.8	4.0	4.1	4.1	4.0	4.0	3.9	3.9
OPEC	30.2	27.1	27.3	27.5	27.6	27.9	28.1	27.9	27.9	28.2	28.0	28.0	28.2	28.6	28.9	28.9	28.9
OTHER COUNTRIES	5.9	6.5	6.9	7.3	7.8	8.6	9.0	9.4	9.8	10.3	10.7	11.2	11.9	12.7	13.5	14.4	15.4
CPE NET EXPORTS	0.8	0.8	0.3	-0.1	-0.6	-1.0	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
TOTAL FREE WORLD	51.3	49.5	49.5	49.6	49.6	49.9	50.3	50.8	51.6	52.6	53.2	53.8	55.0	56.3	57.7	58.8	60.0
NET UNITED STATES IMPORTS (MMB/D)																	
50 STATE AREA	7.6	6.7	6.8	7.0	7.1	7.2	6.8	6.6	6.4	6.5	6.3	6.2	5.8	5.5	5.1	4.8	4.6
SPR PURCHASES	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.4	0.3	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0
U. S. TERRITORIES	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
TOTAL UNITED STATES	7.8	7.2	7.3	7.5	7.6	7.6	7.5	7.3	7.1	7.2	7.1	6.6	6.2	5.9	5.6	5.3	4.9

OIL MARKET SIMULATION MODEL

** OIL MARKET FORECAST (CONTINUED) **

SCENARIO: SPR 7 DATE OF SIMULATION: 11/27/79

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
WORLD OIL PRICE																	
1979 CIF $	22.56	24.23	24.93	25.68	25.99	26.26	26.53	26.85	26.79	27.04	42.21	42.21	42.38	42.60	43.72	44.42	48.65
NET IMPORTS (MMB/D)																	
UNITED STATES	7.6	7.2	7.3	7.5	7.6	7.6	7.5	7.3	7.1	7.2	7.1	6.6	6.2	5.9	5.6	5.3	4.9
CANADA	0.3	0.1	0.1	0.1	0.0	0.0	0.0	-0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.4
JAPAN	5.6	5.4	5.5	5.6	5.7	5.9	6.1	5.9	5.8	5.8	5.7	5.7	5.9	6.2	6.5	6.7	7.0
WESTERN EUROPE	12.6	11.3	10.7	10.2	9.7	9.3	8.9	8.7	8.7	8.7	8.6	8.6	8.9	9.2	9.6	9.7	9.9
OPEC	-27.9	-26.6	-26.5	-26.5	-26.2	-24.1	-23.4	-23.5	-23.2	-23.3	-22.8	-22.4	-22.3	-22.3	-22.2	-21.9	-21.5
OTHER COUNTRIES	2.3	1.4	1.1	0.9	0.6	0.3	-0.0	0.0	0.1	0.2	-0.1	0.1	-0.1	-0.3	-0.5	-1.0	-1.6
TOTAL FREE WORLD	0.6	0.8	0.3	-0.1	-0.6	-1.0	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
IMPORT DEPENDENCE (FRACTION)																	
UNITED STATES	0.43	0.41	0.42	0.43	0.43	0.44	0.43	0.42	0.42	0.42	0.41	0.39	0.38	0.36	0.34	0.32	0.31
CANADA	0.14	0.05	0.05	0.04	0.02	0.02	0.02	-0.01	-0.04	-0.04	-0.05	-0.10	-0.12	-0.13	-0.15	-0.17	-0.19
JAPAN	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
WESTERN EUROPE	0.84	0.79	0.78	0.77	0.75	0.74	0.72	0.71	0.70	0.69	0.68	0.68	0.69	0.70	0.70	0.71	0.72
OTHER COUNTRIES	0.28	0.17	0.14	0.11	0.07	0.03	-0.00	0.00	0.01	0.02	-0.01	0.01	-0.01	-0.02	-0.04	-0.07	-0.10

OIL MARKET SIMULATION MODEL

** OIL MARKET FORECAST **

SCENARIO: &PRIL DATE OF SIMULATION: 11/28/79

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
WORLD OIL PRICE																	
1979 CIF $	22.50	34.22	35.12	35.64	36.09	36.90	37.86	39.90	36.39	35.99	35.97	40.98	42.43	44.00	45.61	47.28	49.10
CONSUMPTION (MMB/D)																	
UNITED STATES	16.8	17.7	17.8	17.9	17.8	17.8	17.6	17.9	16.6	17.0	17.0	17.0	16.8	16.6	16.4	16.2	16.0
CANADA	2.0	1.8	1.8	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.8
JAPAN	5.4	5.4	5.5	5.7	5.7	5.9	6.0	5.9	5.9	5.8	5.9	5.8	6.1	6.3	6.5	6.8	7.0
WESTERN EUROPE	14.9	14.3	13.6	13.3	12.8	12.5	12.2	12.2	12.3	12.5	12.6	12.9	13.1	13.3	13.4	13.6	13.7
OPEC	2.3	2.5	2.8	3.1	3.4	3.8	4.2	4.6	4.7	5.0	5.3	5.6	5.9	6.2	6.6	7.0	7.4
OTHER COUNTRIES	8.1	7.8	8.0	8.2	8.3	8.6	8.9	9.6	10.0	10.6	11.2	11.4	11.6	12.2	12.6	13.2	13.9
TOTAL FREE WORLD	51.3	49.5	49.7	49.8	49.7	50.1	50.8	50.3	51.8	52.5	53.6	54.4	55.4	56.4	57.5	58.7	59.9
PRODUCTION (MMB/D)																	
UNITED STATES	10.4	10.4	10.3	10.1	9.9	9.9	9.8	9.9	10.0	10.1	10.1	10.1	10.3	10.5	10.7	10.9	11.1
CANADA	1.7	1.7	1.7	1.6	1.6	1.6	1.5	1.6	1.6	1.7	1.7	1.8	1.9	1.9	2.0	2.1	2.2
WESTERN EUROPE	2.3	3.0	3.0	3.1	3.2	3.3	3.4	3.5	3.7	3.8	3.9	4.1	4.0	4.0	3.9	3.9	3.8
OPEC	30.2	27.1	27.5	27.7	27.6	28.1	28.0	27.4	27.5	28.2	28.9	28.8	28.6	28.8	28.9	28.9	28.9
OTHER COUNTRIES	5.9	6.5	6.9	7.3	7.8	8.4	9.0	9.4	9.9	10.5	10.6	11.1	11.8	11.5	11.5	11.5	11.5
CPE NET EXPORTS	0.8	0.8	0.3	-0.1	-0.4	-1.0	-1.3	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
TOTAL FREE WORLD	51.3	49.5	49.7	49.8	49.7	50.1	50.2	50.3	51.2	52.5	53.6	54.4	55.4	56.4	57.5	58.7	59.9
NET UNITED STATES IMPORTS (MMB/D)																	
50 STATE AREA	7.4	6.7	6.8	7.0	7.0	7.1	6.7	6.5	6.4	6.5	6.5	6.5	6.6	6.6	6.8	6.8	6.8
SPR PURCHASES	0.1	0.8	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
U. S. TERRITORIES	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
TOTAL UNITED STATES	7.8	7.8	7.6	7.8	7.9	7.9	7.6	6.9	6.8	6.9	6.9	6.9	6.9	6.9	7.3	7.3	7.3

OIL MARKET SIMULATION MODEL

** OIL MARKET FORECAST (CONTINUED) **

SCENARIO: SPR 11 DATE OF SIMULATION: 11/28/79

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
WORLD OIL PRICE																	
1979 CIF $	32.50	34.82	35.12	35.84	36.49	36.90	37.24	38.90	34.38	35.99	38.97	40.98	42.45	44.00	45.61	47.32	49.10
NET IMPORTS (MMB/D)																	
UNITED STATES	7.8	7.8	7.6	7.8	7.9	7.9	7.6	6.9	6.8	6.9	6.9	6.9	6.8	6.8	3.7	3.3	6.9
CANADA	0.3	0.1	0.1	0.1	0.0	0.0	0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.4
JAPAN	9.8	9.6	9.8	9.6	9.7	9.9	6.0	3.9	3.8	3.8	3.8	3.8	6.0	6.3	6.8	6.7	7.0
WESTERN EUROPE	12.6	11.3	10.7	10.2	9.6	9.2	8.8	8.7	8.6	8.7	8.8	8.9	9.1	9.3	9.5	9.7	9.9
OPEC	-27.4	-24.6	-24.7	-20.6	-24.6	-24.3	-23.8	-23.0	-22.9	-23.2	-23.6	-23.2	-22.9	-22.6	-22.2	-21.9	-21.8
OTHER COUNTRIES	8.3	1.6	1.1	0.8	0.5	0.2	-0.1	-0.0	0.2	0.6	0.6	0.7	0.0	-0.3	-0.6	-1.0	-1.4
TOTAL FREE WORLD	0.0	0.8	0.3	-0.1	-0.6	-1.0	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
IMPORT DEPENDENCE (FRACTION)																	
UNITED STATES	0.43	0.41	0.42	0.44	0.44	0.45	0.44	0.41	0.40	0.41	0.41	0.40	0.38	0.36	0.34	0.33	0.31
CANADA	0.14	0.05	0.04	0.03	0.02	0.02	0.02	-.02	-.04	-.05	-.06	-.07	-.09	-.12	-.14	-.17	-.19
JAPAN	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
WESTERN EUROPE	0.84	0.79	0.78	0.77	0.75	0.74	0.72	0.71	0.70	0.69	0.69	0.68	0.69	0.70	0.71	0.71	0.72
OTHER COUNTRIES	0.26	0.17	0.14	0.10	0.06	0.03	-.01	-.00	0.02	0.04	0.06	0.03	0.00	-.02	-.05	-.08	-.10

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR1
NO SPR

TABLE 1.00 SELECTED INDICATORS

LINE	VAR LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1		% CHANGE											
2	FM48	I SPR 1	6,01	8,3	6,8	14,3	9,7	10,2	12,1	13,6	15,4	15,9	16,7
3	FM48	I NO STRATEGIC RESERVE	6,01	8,3	6,1	13,8	9,6	10,3	12,0	13,1	15,9	15,9	16,7
4	FM48	I DIFFERENCE	0,01	-0,0	-0,3	0,5	0,1	-0,1	0,1	0,5	-0,1	-0,0	0,1
5	FM48	I % DIFFERENCE	0,001	-0,55	-5,40	3,53	1,34	-1,16	1,02	3,83	-0,93	-0,28	0,36
6		UNEMPLOYMENT RATE (%)											
7	NRUT	I SPR 1	6,221	6,45	6,61	6,83	9,00	8,95	8,69	7,37	5,80	4,51	3,50
8	NRUT	I NO STRATEGIC RESERVE	6,221	6,35	6,49	6,74	8,82	8,78	8,64	7,49	5,73	4,34	3,33
9	NRUT	I DIFFERENCE	0,011	0,10	0,12	0,10	0,18	0,17	0,05	0,08	0,13	0,17	0,17
10	NRUT	I % DIFFERENCE	0,101	1,26	1,82	1,15	2,02	1,91	0,60	1,11	2,27	3,92	5,07
11		SAVINGS RATE (%)											
12	YPDSAVR	0 SPR 1	5,061	5,62	5,66	5,67	5,75	6,20	6,86	7,93	8,66	9,05	9,18
13	YPDSAVR	0 NO STRATEGIC RESERVE	5,071	5,71	5,72	5,66	5,73	6,21	6,82	7,88	8,63	9,01	9,18
14	YPDSAVR	0 DIFFERENCE	-0,011	-0,09	-0,06	0,01	0,03	-0,01	0,04	0,05	0,02	0,01	-0,00
15	YPDSAVR	0 % DIFFERENCE	-0,151	-1,63	-1,07	0,26	0,44	-0,12	0,52	0,68	0,29	0,09	-0,00
16													
17		SURPLUS OR DEFICIT, FEDERAL (CUR $)											
18	GVSURPFS	I SPR 1	-28,81	-65,6	-29,9	-8,7	-6,9	0,8	12,5	-1,7	-0,3	-9,3	-9,5
19	GVSURPFS	I NO STRATEGIC RESERVE	-28,01	-62,8	-27,8	-6,1	-2,2	2,6	16,2	7,2	5,2	1,3	11,2
20	GVSURPFS	I DIFFERENCE	-0,81	-2,8	-2,0	-2,6	-4,7	-1,8	-3,7	-8,8	-5,7	-10,6	-17,5
21	GVSURPFS	I % DIFFERENCE	3,001	4,41	10,85	41,70	213,07	-67,39	-222,73	-123,15	-180,90	-821,01	-190,73
22		SURPLUS OR DEF, STATE & LOC (CUR $)											
23	GVSURPSS	I SPR 1	18,51	9,6	8,8	-9,4	-11,4	-20,2	-27,4	-28,5	-23,0	-18,1	-11,1
24	GVSURPSS	I NO STRATEGIC RESERVE	18,61	9,6	8,4	-7,7	-8,2	-16,3	-25,0	-24,3	-17,3	-10,3	-1,6
25	GVSURPSS	I DIFFERENCE	-0,11	-1,8	-1,4	-1,9	-3,2	-3,9	-2,4	-4,2	-5,7	-7,8	-9,5
26	GVSURPSS	I % DIFFERENCE	-0,571	-21,81	-18,91	24,55	38,64	23,74	9,66	17,19	33,26	75,93	562,80
27													
28		COMPEN, TO EMPLOYEES TO NAT, INCOME											
29	WBCS/YNS	SPR 1	76,51	77,7	76,6	77,4	78,0	78,4	78,6	78,7	78,7	78,6	78,6
30	WBCS/YNS	NO STRATEGIC RESERVE	76,51	77,7	76,6	77,4	77,8	78,3	78,5	78,5	78,6	78,5	78,4
31	WBCS/YNS	DIFFERENCE	-0,01	0,0	0,0	0,0	0,1	0,1	0,0	0,2	0,1	0,1	0,2
32	WBCS/YNS	% DIFFERENCE	-0,021	0,06	0,00	0,01	0,17	0,14	0,02	0,25	0,14	0,16	0,26
33		PROFITS TO NATIONAL INCOME											
34	CPUBYS/YNS	SPR 1	11,41	10,6	11,7	11,6	11,3	11,0	11,0	11,0	11,0	11,0	11,0
35	CPUBYS/YNS	NO STRATEGIC RESERVE	11,41	10,5	11,6	11,5	11,1	11,5	11,7	11,7	11,5	11,4	11,4
36	CPUBYS/YNS	DIFFERENCE	0,01	0,1	0,1	0,1	0,2	0,1	0,0	-0,0	-0,1	-0,0	0,1
37	CPUBYS/YNS	% DIFFERENCE	0,231	1,15	0,68	0,86	2,20	0,65	0,42	-0,18	-0,99	-0,26	0,53

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR6
NO SPR

TABLE 1.00 SELECTED INDICATORS

LINE	VAR LABEL	I T E M	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1		% CHANGE											
2	EVSPRPP	I SPR I	1.31	2.6	3.0	2.2	3.0	3.3	3.0	3.9	3.7	3.2	3.0
3	EVSPRPP	I NO STRATEGIC RESERVE	1.31	2.8	3.7	2.2	3.2	3.2	3.5	4.0	3.7	3.2	3.5
4	EVSPRPP	I DIFFERENCE	-0.01	-0.1	0.1	0.0	-0.1	0.1	-0.2	-0.0	-0.0	0.0	0.0
5	EVSPRPP	I % DIFFERENCE	-1.21	-5.02	2.87	0.81	-3.21	2.31	5.25	-0.69	-0.70	-0.33	0.92
6		REAL PER CAPITA GNP (THOU 72 $)----											
7	GNPPC	I SPR I	6.408	6.263	6.499	6.556	6.630	6.726	6.871	7.005	7.161	7.345	7.498
8	GNPPC	I NO STRATEGIC RESERVE	6.4101	6.299	6.512	6.566	6.650	6.746	6.875	7.105	7.180	7.379	8.002
9	GNPPC	I DIFFERENCE	-0.0021	-0.036	-0.013	-0.010	-0.023	-0.020	-0.004	-0.019	-0.027	-0.033	-0.038
10	GNPPC	I % DIFFERENCE	-0.03	-0.56	-0.19	-0.16	-0.34	-0.27	-0.06	-0.27	-0.37	-0.43	-0.44
11		% CHANGE											
12	GNPPC	I SPR I	0.11	-2.0	3.6	0.9	1.2	1.4	2.2	3.1	3.9	3.9	3.6
13	GNPPC	I NO STRATEGIC RESERVE	0.11	-1.7	3.4	0.8	1.4	1.3	1.9	3.3	4.0	3.9	4.0
14	GNPPC	I DIFFERENCE	-0.01	-0.2	0.1	0.0	-0.1	0.1	0.2	-0.2	-0.1	0.1	0.0
15	GNPPC	I % DIFFERENCE	-21.69	13.23	2.02	0.27	-13.17	5.08	11.21	-6.59	-2.55	-1.66	0.22
16		REAL PER CAP DISP INC (THOU 72 $)-											
17	YPD/NPT	SPR I	4.475	4.415	4.489	4.525	4.575	4.648	4.759	4.906	5.010	5.089	5.211
18	YPD/NPT	NO STRATEGIC RESERVE	4.4771	4.431	4.500	4.532	4.586	4.661	4.769	4.972	5.020	5.165	5.730
19	YPD/NPT	DIFFERENCE	-0.0011	-0.016	-0.010	-0.007	-0.011	-0.013	-0.011	-0.066	-0.009	-0.076	-0.019
20	YPD/NPT	% DIFFERENCE	-0.03	-0.36	-0.23	-0.16	-0.24	-0.28	-0.24	-0.12	-0.18	-0.49	-0.33
21		% CHANGE											
22	YPD/NPT	SPR I	0.01	-1.4	1.7	0.8	1.1	1.6	2.4	3.1	2.1	1.6	2.4
23	YPD/NPT	NO STRATEGIC RESERVE	0.01	-1.0	1.6	0.7	1.2	1.6	2.1	4.3	1.0	2.9	4.7
24	YPD/NPT	DIFFERENCE	-0.01	-0.3	0.1	0.1	-0.1	-0.0	0.3	-0.1	-0.1	-0.1	-0.3
25	YPD/NPT	% DIFFERENCE	-0.40	31.97	9.01	9.75	-7.05	-2.70	14.01	-2.25	-1.35	-2.50	-6.71
26		CORPORATE PROFITS BEFORE TAXES-----											
27	CPUBTX	I SPR I	217.0	218.0	275.5	301.9	351.0	379.4	435.9	486.5	503.9	610.5	731.0
28	CPUBTX	I NO STRATEGIC RESERVE	217.31	219.5	273.2	300.3	350.2	379.0	436.7	486.7	540.1	617.0	708.2
29	CPUBTX	I DIFFERENCE	0.31	1.5	-2.3	-1.6	-0.8	-0.4	0.9	0.1	36.2	6.5	-8.8
30	CPUBTX	I % DIFFERENCE	0.14	1.16	0.83	1.19	0.41	1.05	1.13	0.17	+0.47	0.20	1.20
31		% CHANGE											
32	CPUBTX	I SPR I	5.71	0.1	26.4	10.5	9.1	16.4	14.9	12.2	11.3	13.6	15.0
33	CPUBTX	I NO STRATEGIC RESERVE	5.61	-0.8	26.8	9.9	10.0	13.7	14.7	13.0	12.2	13.0	13.6
34	CPUBTX	I DIFFERENCE	0.31	0.9	-0.4	0.6	-0.8	0.7	0.1	-0.8	-0.9	0.6	1.4
35	CPUBTX	I % DIFFERENCE	0.79	110.49	-1.56	6.02	-8.52	5.20	0.69	-6.54	-7.71	4.24	9.36
36		BOND RATE (%)----------											
37	FYAAC	8 SPR I	10.20	10.86	11.46	11.78	11.97	11.98	10.10	11.87	11.35	11.00	10.81
38	FYAAC	8 NO STRATEGIC RESERVE	10.20	10.79	11.38	11.66	11.85	11.85	11.98	11.77	11.25	10.88	10.69
39	FYAAC	8 DIFFERENCE	-0.00	0.07	0.12	0.12	0.11	0.13	0.12	0.10	0.10	0.12	0.12
40	FYAAC	8 % DIFFERENCE	-0.00	0.68	1.10	1.09	0.96	1.08	0.97	0.82	0.89	1.09	1.14
41		PRIME COMMERCIAL PAPER RATE (%)----											
42	FYMCP2M	8 SPR I	11.011	11.10	11.19	10.81	10.74	10.56	10.01	9.94	9.89	9.87	9.78
43	FYMCP2M	8 NO STRATEGIC RESERVE	11.011	10.86	11.08	10.82	10.60	10.37	10.39	9.92	9.17	9.00	9.66
44	FYMCP2M	8 DIFFERENCE	-0.000	0.25	0.10	-0.02	0.14	0.17	0.04	0.02	0.12	0.17	0.12
45	FYMCP2M	8 % DIFFERENCE	-0.000	0.25	0.91	-0.14	1.33	1.64	0.34	0.18	1.30	1.82	1.24
46		MONEY SUPPLY----------											
47	FM4B	I SPR I	1036.3	1122.1	1221.1	1309.8	1531.1	1667.4	1892.3	2149.6	2400.9	2674.7	2990.5
48	FM4B	I NO STRATEGIC RESERVE	1036.2	1122.7	1225.0	1314.3	1527.7	1665.4	1886.1	2138.0	2407.6	2860.9	3691.1
49	FM4B	I DIFFERENCE	0.11	-0.6	-3.9	-5.5	3.5	2.0	6.3	13.8	12.9	13.8	17.6
50	FM4B	I % DIFFERENCE	0.011	-0.06	-0.32	0.11	0.23	0.12	0.33	0.65	0.54	0.48	0.59

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR1
NO SPR

TABLE 1.00 SELECTED INDICATORS

LINE	VAR	LABEL	I T E M	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1			% CHANGE											
2	NLC		I SPR I	2.61	2.2	1.7	1.6	1.3	1.1	1.1	1.0	1.0	1.3	1.9
3	NLC		I NO STRATEGIC RESERVE	2.61	2.2	1.7	1.6	1.3	1.2	1.1	1.0	1.0	1.3	1.9
4	NLC		I DIFFERENCE	0.01	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
5	NLC		I % DIFFERENCE	0.0	0.0	-0.02	-0.12	-0.23	-0.30	-0.39	-0.40	-0.17	0.03	-0.07
6			PARTICIPATION RATE											
7	NRLC+		SPR I	63.6	64.1	64.4	64.5	64.7	64.8	64.9	64.9	64.8	65.1	65.9
8	NRLC+		NO STRATEGIC RESERVE	63.6	64.1	64.4	64.5	64.7	64.8	64.9	64.9	64.8	65.2	65.9
9	NRLC+		DIFFERENCE	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
10	NRLC+		% DIFFERENCE	0.0	0.0	-0.00	-0.00	-0.00	-0.01	-0.01	-0.02	-0.02	-0.02	-0.04
11			% CHANGE											
12	NRLC+		SPR I	0.71	0.8	0.6	0.2	0.1	0.2	0.1	-0.0	-0.1	0.5	1.4
13	NRLC+		NO STRATEGIC RESERVE	0.71	0.8	0.6	0.2	0.1	0.2	0.1	0.0	-0.1	0.5	1.4
14	NRLC+		DIFFERENCE	0.01	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0
15	NRLC+		% DIFFERENCE	0.0	0.0	-0.07	-0.34	-1.17	-1.40	-3.36	-120.28	2.42	0.09	-0.11
16														
17			EMPLOYMENT (MILLIONS)											
18	NEMT		I SPR I	96.603	96.605	97.982	98.782	99.694	101.092	102.704	105.010	107.735	110.895	113.991
19	NEMT		I NO STRATEGIC RESERVE	96.614	96.715	98.028	98.891	100.095	101.287	102.774	105.110	107.906	110.911	114.012
20	NEMT		I DIFFERENCE	-0.0101	-0.110	-0.126	-0.109	-0.400	-0.196	-0.070	-0.100	-0.170	-0.016	-0.021
21	NEMT		I % DIFFERENCE	-0.01	-0.11	-0.13	-0.11	-0.40	-0.19	-0.07	-0.10	-0.16	-0.02	-0.02
22			% CHANGE											
23	NEMT		I SPR I	2.21	-0.2	1.4	0.8	1.1	1.2	1.6	2.2	2.6	2.7	3.0
24	NEMT		I NO STRATEGIC RESERVE	2.21	-0.1	1.4	0.9	1.2	1.2	1.5	2.3	2.6	2.8	3.0
25	NEMT		I DIFFERENCE	-0.01	-0.1	-0.0	0.0	-0.1	0.0	0.1	-0.0	-0.1	-0.0	0.0
26	NEMT		I % DIFFERENCE	-0.01	101.32	-0.02	2.10	-7.07	0.71	6.59	-1.00	-2.03	-1.45	0.09
27														
28			WAGE RATE PER WEEK, ALL INDUSTRIES											
29	WRCE		I SPR I	290.21	310.2	334.0	345.0	410.0	480.1	548.9	605.0	670.6	744.5	823.3
30	WRCE		I NO STRATEGIC RESERVE	290.21	310.6	353.0	343.8	437.0	485.6	548.1	599.6	663.8	735.8	813.7
31	WRCE		I DIFFERENCE	0.01	0.4	1.0	1.7	2.5	3.5	0.2	5.4	6.3	7.8	9.6
32	WRCE		I % DIFFERENCE	0.01	0.19	0.28	0.84	0.58	0.73	0.04	0.91	0.97	1.06	1.17
33			% CHANGE											
34	WRCE		I SPR I	9.21	10.0	10.9	11.7	11.1	11.3	11.3	11.1	10.8	10.9	10.7
35	WRCE		I NO STRATEGIC RESERVE	9.21	9.8	10.8	11.6	11.0	11.1	11.4	11.0	10.7	10.8	10.6
36	WRCE		I DIFFERENCE	0.01	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
37	WRCE		I % DIFFERENCE	0.14	2.00	0.90	1.53	1.63	1.50	0.79	1.08	0.88	0.88	1.02
38														
39			PRODUCTIVITY - ALL INDUSTRIES											
40	QAPPD		I SPR I	14.665	14.914	14.890	15.028	15.185	15.359	15.580	15.867	16.213	16.580	16.887
41	QAPPD		I NO STRATEGIC RESERVE	14.667	14.935	14.990	15.035	15.206	15.367	15.585	15.896	16.250	16.580	16.926
42	QAPPD		I DIFFERENCE	-0.002	-0.021	-0.099	-0.007	-0.021	-0.013	0.001	-0.029	-0.035	-0.000	-0.039
43	QAPPD		I % DIFFERENCE	-0.01	-0.14	-0.66	-0.05	-0.14	-0.08	0.01	-0.17	-0.21	-0.00	-0.23
44			% CHANGE											
45	QAPPD		I SPR I	-1.47	-0.9	2.6	0.9	1.0	1.1	1.3	1.8	2.2	2.0	2.1
46	QAPPD		I NO STRATEGIC RESERVE	-1.47	-0.8	2.5	0.9	1.1	1.1	1.5	2.0	2.2	2.0	2.1
47	QAPPD		I DIFFERENCE	-0.01	-0.1	0.1	0.0	-0.1	0.1	-0.2	-0.2	-0.0	-0.0	0.0
48	QAPPD		I % DIFFERENCE	1.22	10.07	3.20	1.09	-0.14	5.19	0.36	-0.11	-2.05	-1.16	0.37
49														
50			PRODUCTIVITY - ALL MANUFACTURING											
51	EVQMFPP		I SPR I	8.102	8.316	8.433	8.822	9.091	9.392	9.728	10.106	10.479	10.845	11.191
52	EVQMFPP		I NO STRATEGIC RESERVE	8.103	8.329	8.437	8.825	9.101	9.397	9.721	10.115	10.491	10.863	11.207
53	EVQMFPP		I DIFFERENCE	-0.001	-0.013	-0.004	-0.003	-0.010	-0.005	0.005	-0.013	-0.017	-0.018	-0.015
54	EVQMFPP		I % DIFFERENCE	-0.02	-0.15	-0.05	-0.04	-0.11	-0.06	0.05	-0.13	-0.16	-0.17	-0.14

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPRING
NO BPA

TABLE 1.00 SELECTED INDICATORS

LINE FOR LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
	GROSS NATIONAL PRODUCT (COM $)											
	GNP STRATEGIC RESERVE											
	GNP DIFFERENCE											
	% DIFFERENCE											
	% CHANGE											
	GNP STRATEGIC RESERVE											
	GNP DIFFERENCE											
	% DIFFERENCE											
	GROSS NATIONAL PRODUCT (72 $)											
	GNP STRATEGIC RESERVE											
	GNP DIFFERENCE											
	% DIFFERENCE											
	% CHANGE											
	GNP STRATEGIC RESERVE											
	GNP DIFFERENCE											
	% DIFFERENCE											
	GROSS NAT. PROD. DEFL. (1972=100.0)											
	GNP STRATEGIC RESERVE											
	GNP DIFFERENCE											
	% DIFFERENCE											
	% CHANGE											
	GNP STRATEGIC RESERVE											
	GNP DIFFERENCE											
	% DIFFERENCE											
	POPULATION (MILLIONS)											
	GNP STRATEGIC RESERVE											
	GNP DIFFERENCE											
	% DIFFERENCE											
	% CHANGE											
	GNP STRATEGIC RESERVE											
	GNP DIFFERENCE											
	% DIFFERENCE											
	LABOR FORCE (MILLIONS)											
	GNP STRATEGIC RESERVE											
	GNP DIFFERENCE											
	% DIFFERENCE											

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR1
NO SPR

TABLE 2.00 GROSS NATIONAL PRODUCT (S72)

LINE	VAR	LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1														
2			---------CONSTANT 72 DOLLARS---------											
3														
4			GROSS NATIONAL PRODUCT----------											
5	GNP		$PR 1----------	1411.6	1396.3	1457.8	1486.5	1516.9	1552.3	1600.7	1666.2	1746.9	1836.9	1949.0
6	GNP		NO STRATEGIC RESERV----------	1412.2	1399.9	1460.6	1488.6	1522.1	1556.5	1601.7	1670.8	1753.6	1838.9	1951.2
7	GNP		DIFFERENCE ----------	-0.61	-3.6	-2.8	-2.1	-5.1	-4.3	-1.0	-4.6	-6.5	-2.0	-2.2
8	GNP		% DIFFERENCE ----------	-0.03	-0.26	-0.19	-0.14	-0.34	-0.27	-0.06	-0.27	-0.37	-0.03	-0.02
9			% CHANGE											
10	GNP		$PR 1----------	0.0	-1.1	4.4	1.8	2.2	2.3	3.1	4.1	4.8	5.2	6.1
11	GNP		NO STRATEGIC RESERVE----------	0.0	-0.9	4.3	1.8	2.6	2.3	2.9	4.3	4.9	4.9	6.1
12	GNP		DIFFERENCE ----------	-0.0	-0.2	0.1	0.0	-0.2	0.1	0.2	-0.2	-0.1	-0.1	0.0
13	GNP		% DIFFERENCE ----------	-2.79	20.52	1.59	2.00	-7.65	2.93	7.50	-5.15	-2.00	-1.36	0.10
14														
15			PERSONAL CONSUMPTION EXPENDITURES--											
16	CE		$PR 1----------	911.8	902.3	926.6	945.7	963.5	984.6	1011.6	1054.7	1109.6	1167.9	1240.1
17	CE		NO STRATEGIC RESERVE----------	911.8	904.7	928.1	947.3	966.0	987.2	1012.1	1056.5	1111.8	1170.7	1243.0
18	CE		DIFFERENCE ----------	-0.21	-2.4	-1.5	-1.6	-2.5	-2.6	-0.5	-1.7	-2.1	-2.4	-3.0
19	CE		% DIFFERENCE ----------	-0.02	-0.26	-0.16	-0.17	-0.26	-0.27	-0.05	-0.16	-0.19	-0.20	-0.32
20			% CHANGE											
21	CE		$PR 1----------	1.21	-1.0	2.7	2.1	1.9	2.2	2.7	4.3	5.2	5.2	5.7
22	CE		NO STRATEGIC RESERVE----------	1.21	-0.8	2.6	2.1	2.0	2.2	2.5	4.4	5.2	5.3	5.7
23	CE		DIFFERENCE ----------	-0.01	-0.2	0.1	-0.0	-0.1	-0.0	0.2	-0.1	-0.0	-0.1	-0.0
24	CE		% DIFFERENCE ----------	-2.01	30.06	4.14	-0.46	-4.93	-0.82	8.96	-2.78	-0.60	-1.96	-0.47
25														
26			DURABLE GOODS----------											
27	CED		$PR 1----------	142.6	134.2	142.6	145.9	148.3	148.3	151.6	162.6	177.7	193.6	213.1
28	CED		NO STRATEGIC RESERVE----------	142.9	135.3	143.2	146.5	147.6	149.4	151.5	163.2	178.8	194.9	215.1
29	CED		DIFFERENCE ----------	-0.31	-1.1	-0.5	-0.6	+1.1	-1.1	+0.0	-0.5	-1.0	-1.7	-1.9
30	CED		% DIFFERENCE ----------	-0.07	-0.80	-0.38	-0.41	+0.76	-0.75	-0.03	-0.31	-0.59	-0.89	-0.90
31			% CHANGE											
32	CED		$PR 1----------	-0.7	-6.0	6.3	2.3	1.6	1.3	2.1	7.2	9.2	9.7	10.3
33	CED		NO STRATEGIC RESERVE----------	-0.6	-5.3	5.8	2.4	0.8	1.3	1.4	7.8	9.5	9.0	10.4
34	CED		DIFFERENCE ----------	-0.11	-0.7	0.4	-0.0	+0.3	0.0	0.7	-0.5	-0.1	-0.3	-0.0
35	CED		% DIFFERENCE ----------	2.75	12.96	7.66	-1.35	-57.12	0.61	53.02	-6.75	-0.83	-3.69	-9.18
36														
37			NONDURABLE GOODS----------											
38	CEN		$PR 1----------	342.7	338.8	343.6	347.0	350.5	354.7	361.5	372.7	387.5	403.6	421.6
39	CEN		NO STRATEGIC RESERVE----------	342.8	339.4	344.2	347.6	351.2	355.5	361.7	373.2	388.1	404.4	422.3
40	CEN		DIFFERENCE ----------	-0.1	-0.7	-0.5	-0.5	-0.8	-0.8	-0.3	-0.5	-0.6	-0.8	-0.9
41	CEN		% DIFFERENCE ----------	-0.02	-0.20	-0.15	-0.16	-0.22	-0.23	-0.07	-0.12	-0.15	-0.20	-0.21
42			% CHANGE											
43	CEN		$PR 1----------	+0.2	-1.2	1.4	1.0	1.0	1.2	1.9	3.1	4.0	4.1	4.4
44	CEN		NO STRATEGIC RESERVE----------	-0.1	-1.0	1.4	1.0	1.1	1.2	1.7	3.2	4.0	4.2	4.4
45	CEN		DIFFERENCE ----------	+0.0	-0.2	0.0	-0.0	-0.1	-0.0	0.2	-0.1	-0.0	-0.1	-0.0
46	CEN		% DIFFERENCE ----------	12.12	18.21	3.21	-0.19	-0.03	-0.92	9.43	-1.89	-0.08	-1.34	-0.27
47														
48			SERVICES----------											
49	CES		$PR 1----------	426.1	429.3	440.4	452.8	464.7	481.6	498.7	519.6	544.2	570.6	599.6
50	CES		NO STRATEGIC RESERVE----------	426.1	429.9	440.7	453.2	467.3	482.3	498.9	520.1	544.7	571.4	600.8
51	CES		DIFFERENCE ----------	-0.1	-0.6	-0.4	-0.4	-0.6	-0.7	-0.2	-0.4	-0.5	-0.9	-1.1
52	CES		% DIFFERENCE ----------	-0.011	-0.14	-0.09	-0.09	-0.14	-0.14	-0.04	-0.08	-0.10	-0.15	-0.18

TABLE 2.00 GROSS NATIONAL PRODUCT (BIL

LINE	VAR LABEL	I T E M	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1		% CHANGE											
2	CE0	I SPR I	3.7	0.6	2.0	2.6	3.1	3.0	3.0	3.0	3.1	3.0	3.0
3	CE0	I NO STRATEGIC RESERVE	3.7	0.9	2.5	2.0	3.1	3.0	3.0	3.0	3.1	3.0	3.0
4	CE0	I DIFFERENCE	+0.01	-0.1	0.1	-0.0	-0.0	-0.0	0.1	-0.0	-0.0	-0.1	+0.0
5	CE0	I % DIFFERENCE	+0.37	-14.36	8.26	-0.31	-1.43	-0.19	3.06	-1.17	-0.69	-1.10	+0.57
6		GROSS PRIVATE DOMESTIC INVESTMENT											
7	IGV	I SPR I	209.0	184.7	218.5	219.2	224.5	229.1	238.1	248.0	261.0	300.9	340.8
8	IGV	I NO STRATEGIC RESERVE	209.0	190.7	219.0	219.8	226.8	229.0	237.5	246.7	262.5	302.3	343.1
9	IGV	I DIFFERENCE	0.01	-1.0	-0.5	-0.6	-2.3	-1.5	0.6	-0.7	-1.5	-1.4	-2.9
10	IGV	I % DIFFERENCE	0.011	-0.55	-0.41	-0.27	-1.03	-0.67	0.24	-0.27	-0.53	-0.47	-0.84
11		% CHANGE											
12	IGV	I SPR I	-0.0	-0.5	15.2	0.4	2.4	2.0	4.0	4.2	5.2	7.0	7.3
13	IGV	I NO STRATEGIC RESERVE	-0.0	-0.5	15.0	0.3	3.4	1.0	3.4	4.0	6.4	7.0	6.0
14	IGV	I DIFFERENCE	0.0	-0.5	0.2	0.1	-1.0	0.9	1.0	-0.6	-1.1	-0.1	0.3
15	IGV	I % DIFFERENCE	+0.15	5.60	1.04	260.67	-29.30	30.01	27.69	-4.27	-1.99	-0.79	4.94
16													
17		FIXED INVESTMENT											
18	IGF	I SPR I	199.0	187.5	210.5	214.1	219.5	223.0	228.5	239.0	252.5	272.7	293.9
19	IGF	I NO STRATEGIC RESERVE	199.7	188.4	211.5	215.5	220.7	217.0	223.7	240.3	254.1	275.1	296.2
20	IGF	I DIFFERENCE	-0.11	-0.9	-1.0	-0.4	-1.2	+1.0	+0.8	-1.1	-1.6	-2.4	-2.3
21	IGF	I % DIFFERENCE	+0.03	+0.48	-0.47	-0.19	-0.55	+0.70	+0.36	-0.46	-0.64	-0.70	+0.78
22		% CHANGE											
23	IGF	I SPR I	-0.3	-0.1	12.2	1.3	0.6	0.0	3.8	7.0	7.0	9.0	9.7
24	IGF	I NO STRATEGIC RESERVE	-0.3	-0.6	12.2	1.3	0.1	1.1	3.1	7.8	7.8	8.0	8.0
25	IGF	I DIFFERENCE	-0.0	+0.6	0.0	0.1	+0.9	0.8	0.7	-0.8	-0.8	+0.1	0.8
26	IGF	I % DIFFERENCE	11.99	7.59	0.11	29.72	+50.20	253.85	22.06	-9.50	-9.24	-1.19	9.28
27													
28		RESIDENTIAL											
29	IGFR	I SPR I	149.0	148.1	159.8	162.2	164.6	166.9	161.3	173.0	181.3	195.1	209.0
30	IGFR	I NO STRATEGIC RESERVE	149.7	149.0	161.2	163.6	166.7	166.1	162.3	171.4	180.5	196.0	210.0
31	IGFR	I DIFFERENCE	-0.0	-0.9	-0.7	-1.1	-1.2	+0.8	-1.0	+1.6	+0.8	-0.8	-1.0
32	IGFR	I % DIFFERENCE	+0.02	-0.31	+0.46	-0.72	-0.75	+0.52	-0.59	+0.89	+0.45	-0.80	-0.73
33		% CHANGE											
34	IGFR	I SPR I	0.0	-1.1	8.0	1.0	1.0	1.0	4.0	9.0	8.0	7.0	7.0
35	IGFR	I NO STRATEGIC RESERVE	0.0	-0.4	8.2	1.4	1.9	0.7	3.0	8.0	8.0	8.0	7.0
36	IGFR	I DIFFERENCE	-0.0	-0.7	-0.1	-0.4	-0.8	0.3	0.1	+0.1	0.0	-0.0	+0.0
37	IGFR	I % DIFFERENCE	+0.69	65.16	-1.85	-10.98	-13.79	-1.67	0.76	-1.35	0.89	-0.98	+0.68
38													
39		RESIDENTIAL STRUCTURES											
40	IGFR	I SPR I	52.0	53.6	58.7	59.4	59.8	58.5	54.0	58.1	59.6	70.7	82.0
41	IGFR	I NO STRATEGIC RESERVE	52.0	54.0	60.3	60.0	61.0	58.9	54.3	57.2	59.7	70.5	82.0
42	IGFR	I DIFFERENCE	+0.0	-0.4	-0.5	-0.5	-1.1	-0.4	-0.3	0.8	0.1	+0.3	0.0
43	IGFR	I % DIFFERENCE	+0.07	-1.14	-0.84	0.56	-1.69	-0.74	1.38	0.10	+0.59	+0.39	0.05
44		% CHANGE											
45	IGFR	I SPR I	-10.0	-19.9	37.5	1.9	-1.7	-2.2	8.3	11.0	10.0	8.0	8.9
46	IGFR	I NO STRATEGIC RESERVE	-10.1	-18.5	36.9	0.5	0.7	-3.5	4.1	14.0	10.0	8.0	8.9
47	IGFR	I DIFFERENCE	+0.1	-1.0	0.6	1.4	-2.4	1.1	4.2	-3.0	+0.0	+0.0	0.0
48	IGFR	I % DIFFERENCE	0.58	5.44	1.69	297.75	+335.72	-33.51	53.99	-10.97	-7.08	-0.87	0.00
49													
50		CHANGE IN BUSINESS INVENTORIES											
51	IGIV	I SPR I	10.0	2.8	9.0	9.1	10.0	10.7	10.0	10.0	11.5	20.0	20.0
52	IGIV	I NO STRATEGIC RESERVE	9.9	2.3	9.1	9.5	10.1	10.6	11.0	10.0	12.0	20.7	20.0
53	IGIV	I DIFFERENCE	0.1	+0.1	-0.1	-0.2	-0.1	0.1	-0.8	0.0	-0.1	-0.1	0.0
54	IGIV	I % DIFFERENCE	0.00	-0.21	-1.20	-2.38	-0.92	0.62	-8.28	0.02	-0.62	-0.62	-0.01

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR1
NO SPR

TABLE 2.00 GROSS NATIONAL PRODUCT (ST2)

LINE	VAR	LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1			NET EXPORTS OF GOODS AND SERVICES=>											
2	YBB		SPR ------------------------------	15.01	29.1	31.2	36.0	38.0	40.1	45.0	40.7	38.8	38.4	38.6
3	YBB		NO STRATEGIC RESERVE--------------	15.01	25.3	31.7	33.4	36.3	40.2	44.1	42.9	40.4	42.0	43.0
4	YBB		DIFFERENCE -----------------------	+0.01	+0.8	-0.6	+0.6	+0.1	-0.1	+1.1	-2.1	-1.6	-3.6	-4.4
5	YBB		% DIFFERENCE ---------------------	+1.01	+0.83	-1.01	-1.77	-0.76	+0.02	+2.55	-4.90	-7.17	-7.10	-8.00
6														
7			EXPORTS----------------------------											
8	YEB		SPR ------------------------------	110.0	127.9	138.7	144.8	151.1	160.2	171.3	174.1	170.0	180.0	194.5
9	YEB		NO STRATEGIC RESERVE--------------	110.7	127.0	138.6	144.3	150.8	159.5	171.1	175.5	180.1	190.7	206.7
10	YEB		DIFFERENCE -----------------------	-0.11	0.1	0.1	+0.1	0.3	0.8	0.1	-1.4	-2.1	-4.0	-12.2
11	YEB		% DIFFERENCE ---------------------	-0.00	0.07	0.07	+0.04	0.19	0.48	0.08	-0.80	-1.19	-1.03	-1.09
12			% CHANGE											
13	YEB		SPR ------------------------------	8.01	7.0	8.5	4.3	4.3	6.0	6.9	1.6	2.3	5.9	7.3
14	YEB		NO STRATEGIC REBERVE--------------	9.01	7.7	8.9	4.1	4.5	5.7	7.3	2.5	2.6	5.9	7.3
15	YEB		DIFFERENCE -----------------------	-0.11	0.1	-0.0	+0.1	0.2	0.3	-0.0	-0.9	-0.3	0.1	+0.1
16	YEB		% DIFFERENCE ---------------------	-0.71	1.82	-0.06	+2.01	5.30	5.33	-0.75	-35.41	-13.09	2.01	+0.70
17														
18			IMPORTS----------------------------											
19	YMB		SPR ------------------------------	103.0	100.8	107.5	111.0	113.1	120.1	126.2	133.0	131.2	142.0	167.9
20	YMB		NO STRATEGIC RESERVE--------------	103.1	100.5	107.0	110.9	114.0	119.6	125.0	134.5	140.0	151.9	186.8
21	YMB		DIFFERENCE -----------------------	-0.11	0.3	0.5	0.0	0.0	0.5	1.2	-0.7	0.0	-0.9	1.0
22	YMB		% DIFFERENCE ---------------------	0.00	0.29	0.50	0.00	0.00	0.41	0.98	0.50	0.50	0.54	0.59
23			% CHANGE											
24	YMB		SPR ------------------------------	5.0	+0.0	6.6	3.0	3.3	6.1	5.1	5.7	5.9	8.1	10.0
25	YMB		NO STRATEGIC RESERVE--------------	5.3	+0.0	6.4	3.6	3.3	6.1	5.0	6.1	5.0	8.1	9.0
26	YMB		DIFFERENCE -----------------------	0.1	0.0	0.2	+0.6	0.0	0.0	0.3	+0.4	0.0	+0.0	1.0
27	YMB		% DIFFERENCE ---------------------	1.69	+33.83	3.00	+0.74	0.00	0.65	5.00	-7.09	0.00	+0.49	1.00
28														
29			GOV'T PURCH OF GOODS AND SERVICES=>											
30	GVBY		SPR ------------------------------	279.2	279.2	281.5	286.7	293.0	299.5	306.1	310.7	319.0	328.9	339.0
31	GVBY		NO STRATEGIC RESERVE--------------	279.2	279.2	281.5	286.7	293.0	299.5	306.1	310.7	319.0	328.9	339.0
32	GVBY		DIFFERENCE -----------------------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	GVBY		% DIFFERENCE ---------------------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34			% CHANGE											
35	GVBY		SPR ------------------------------	0.7	1.0	0.8	1.8	2.2	2.2	2.2	2.2	2.2	2.3	2.2
36	GVBY		NO STRATEGIC RESERVE--------------	0.7	1.0	0.8	1.8	2.2	2.2	2.2	2.2	2.2	2.3	2.2
37	GVBY		DIFFERENCE -----------------------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	GVBY		% DIFFERENCE ---------------------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39														
40			FEDERAL----------------------------											
41	GVBF		SPR ------------------------------	100.9	100.9	104.3	108.5	108.7	111.0	113.3	119.7	119.1	120.7	128.1
42	GVBF		NO STRATEGIC RESERVE--------------	100.9	100.9	104.3	108.5	108.7	111.0	113.3	119.7	119.1	120.7	128.1
43	GVBF		DIFFERENCE -----------------------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44	GVBF		% DIFFERENCE ---------------------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45			% CHANGE											
46	GVBF		SPR ------------------------------	2.3	0.0	3.3	4.1	2.1	2.1	2.0	4.1	2.0	2.4	2.0
47	GVBF		NO STRATEGIC RESERVE--------------	2.3	0.0	3.3	4.1	2.1	2.1	2.0	4.1	2.0	2.4	2.0
48	GVBF		DIFFERENCE -----------------------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	GVBF		% DIFFERENCE ---------------------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR1
NO SPR

TABLE 2.00 GROSS NATIONAL PRODUCT (872)

LINE	VAR	LABEL	I T E M	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1			STATE AND LOCAL											
2	GVPS	I	SPR I	174.3	176.3	177.2	180.2	184.2	188.4	192.8	197.0	201.6	206.2	210.9
3	GVPS	I	NO STRATEGIC RESERVE	174.3	176.3	177.2	180.2	184.2	188.4	192.8	197.0	201.6	206.2	210.9
4	GVPS	I	DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	GVPS	I	% DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6			% CHANGE											
7	GVPS	I	SPR I	-0.2	1.1	0.5	1.7	2.2	2.3	2.3	2.2	2.3	2.3	2.3
8	GVPS	I	NO STRATEGIC RESERVE	-0.2	1.1	0.5	1.7	2.2	2.3	2.3	2.2	2.3	2.3	2.3
9	GVPS	I	DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	GVPS	I	% DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR3
NO SPR

TABLE 1.00 SELECTED INDICATORS

LINE	VAR	LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
			GROSS NATIONAL PRODUCT (CUR $)------											
1				2360.0	2547.3	2906.2	3260.0	3643.3	4080.9	4620.2	5231.6	5939.1	6701.3	7567.7
2	GNPS	I	SPR 3----------	2360.5	2547.2	2905.1	3248.1	3623.8	4051.2	4582.6	5190.6	5893.7	6649.1	7501.8
3	GNPS	I	NO STRATEGIC RESERVE----------	2360.5	2547.2	2905.1	3248.1	3623.8	4051.2	4582.6	5190.6	5893.7	6649.1	7501.8
4	GNPS	I	DIFFERENCE ----------	-0.01	0.1	-0.9	11.8	19.5	29.7	37.6	41.0	45.5	136.2	66.0
5	GNPS	I	% DIFFERENCE ----------	-0.021	0.00	-0.17	0.43	0.54	0.73	1.09	1.39	1.88	1.99	1.14
			% CHANGE											
6				10.01	8.9	13.9	12.0	11.8	12.0	13.2	13.2	13.5	12.8	12.9
7	GNPS	I	SPR 3----------	10.01	8.8	14.0	11.7	11.6	11.8	13.1	13.3	13.5	12.8	12.9
8	GNPS	I	NO STRATEGIC RESERVE----------	10.01	8.8	14.0	11.7	11.6	11.8	13.1	13.3	13.5	12.8	12.9
9	GNPS	I	DIFFERENCE ----------	-0.01	0.0	-0.0	0.2	0.1	0.2	0.0	-0.1	0.1	0.0	-0.0
10	GNPS	I	% DIFFERENCE ----------	-0.001	0.07	-0.01	5.08	1.06	1.85	0.01	-0.00	0.59	0.35	-0.00
11														
12			GROSS NATIONAL PRODUCT (72 $)-------											
13	GNP	I	SPR 3----------	1411.6	1397.7	1440.1	1480.6	1512.0	1542.9	1597.6	1660.0	1730.7	1857.0	1933.9
14	GNP	I	NO STRATEGIC RESERVE----------	1412.2	1399.9	1440.0	1480.8	1522.1	1556.5	1601.7	1670.0	1753.4	1838.9	1933.2
15	GNP	I	DIFFERENCE ----------	-0.6	-2.3	-12.5	-0.2	-10.0	-13.7	-4.1	-9.9	-22.7	18.1	0.7
16	GNP	I	% DIFFERENCE ----------	-0.03	-0.16	-0.85	-0.02	-0.66	-0.88	-0.26	-0.57	-0.16	0.99	0.04
			% CHANGE											
17				0.0	-1.0	3.0	2.2	2.1	2.0	3.5	3.6	4.2	7.3	4.1
18	GNP	I	SPR 3----------	0.0	-1.0	3.0	2.8	2.1	2.0	3.5	3.6	4.2	7.3	4.1
19	GNP	I	NO STRATEGIC RESERVE----------	0.0	-0.9	2.9	2.8	2.8	2.3	2.9	4.3	5.0	4.8	5.1
20	GNP	I	DIFFERENCE ----------	-0.0	-0.1	-0.7	0.0	-0.6	-0.2	0.5	-0.7	-0.8	2.5	-1.0
21	GNP	I	% DIFFERENCE ----------	-2.0	15.9	-16.0	25.0	-10.9	-9.9	22.2	-2.7	4.7	24.8	-19.4
22														
23			GROSS NAT. PROD. DEFL. (1972=100.0)											
24	PDGNP	I	SPR 3----------	169.7	182.3	200.3	220.2	241.0	264.5	289.2	314.3	339.3	363.2	389.9
25	PDGNP	I	NO STRATEGIC RESERVE----------	169.7	182.3	199.9	218.3	238.1	260.3	284.2	308.8	333.0	361.0	391.1
26	PDGNP	I	DIFFERENCE ----------	0.01	0.1	1.0	2.0	2.9	4.2	5.0	5.5	6.4	2.2	-1.2
27	PDGNP	I	% DIFFERENCE ----------	0.011	0.17	0.49	0.89	1.21	1.63	1.75	1.77	1.92	0.59	-1.11
			% CHANGE											
28				9.0	10.0	9.9	9.9	9.4	9.8	9.3	8.7	7.9	7.0	9.3
29	PDGNP	I	SPR 3----------	9.0	9.8	9.5	9.9	9.4	9.8	9.3	8.6	8.1	8.3	8.2
30	PDGNP	I	NO STRATEGIC RESERVE----------	9.0	9.8	9.5	9.9	9.4	9.8	9.3	8.6	8.1	8.3	8.2
31	PDGNP	I	DIFFERENCE ----------	0.01	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	-0.2	-0.1
32	PDGNP	I	% DIFFERENCE ----------	0.001	1.76	0.14	1.76	0.00	0.00	1.45	0.86	-2.00	-0.84	1.54
33														
34			POPULATION (MILLIONS)----------											
35	NPT	I	SPR 3----------	220.3	222.26	224.29	226.43	228.80	230.79	232.97	235.17	237.33	239.48	241.58
36	NPT	I	NO STRATEGIC RESERVE----------	220.3	222.26	224.29	226.43	228.80	230.79	232.97	235.17	237.33	239.48	241.58
37	NPT	I	DIFFERENCE ----------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	NPT	I	% DIFFERENCE ----------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			% CHANGE											
39				0.0	0.9	0.9	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9
40	NPT	I	SPR 3----------	0.0	0.9	0.9	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9
41	NPT	I	NO STRATEGIC RESERVE----------	0.0	0.9	0.9	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9
42	NPT	I	DIFFERENCE ----------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43	NPT	I	% DIFFERENCE ----------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44														
45			LABOR FORCE (MILLIONS)----------											
46	NLC	I	SPR 3----------	102.8	105.09	106.89	108.35	109.77	111.02	112.22	113.43	114.60	115.88	118.10
47	NLC	I	NO STRATEGIC RESERVE----------	102.8	105.09	106.89	108.36	109.78	111.04	112.25	113.38	114.66	115.99	118.13
48	NLC	I	DIFFERENCE ----------	0.0	0.0	0.00	-0.00	-0.01	-0.02	-0.03	-0.04	-0.05	-0.06	-0.03
49	NLC	I	% DIFFERENCE ----------	0.0	0.0	0.00	-0.00	-0.01	-0.02	-0.03	-0.04	-0.05	-0.05	-0.04

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR3
NO SPR

TABLE 1.00 SELECTED INDICATORS

LINE	VAR	LABEL	I T E M	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1			% CHANGE											
2	NLC	I	SPR 3	2.4	2.2	1.7	1.6	1.3	1.1	1.1	1.0	0.9	1.3	1.9
3	NLC	I	NO STRATEGIC RESERVE	2.4	2.2	1.7	1.6	1.3	1.2	1.1	1.0	1.0	1.3	1.9
4	NLC	I	DIFFERENCE	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0
5	NLC	I	% DIFFERENCE	0.0	0.0	-0.02	-0.09	-0.49	-0.78	-0.99	-1.20	-0.88	-0.16	0.43
6			PARTICIPATION RATE											
7	NRLC		SPR 3	63.6	64.1	64.4	64.5	64.7	64.8	64.9	64.9	64.8	65.1	65.9
8	NRLC		NO STRATEGIC RESERVE	63.6	64.1	64.4	64.5	64.7	64.8	64.9	64.9	64.8	65.2	65.9
9	NRLC		DIFFERENCE	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
10	NRLC		% DIFFERENCE	0.0	0.0	-0.00	-0.00	-0.01	-0.02	-0.03	-0.04	-0.05	-0.05	-0.00
11			% CHANGE											
12	NRLC		SPR 3	0.7	0.8	0.4	0.2	0.3	0.2	0.1	-0.0	-0.1	0.5	1.4
13	NRLC		NO STRATEGIC RESERVE	0.7	0.8	0.4	0.2	0.3	0.2	0.1	0.0	-0.1	0.5	1.4
14	NRLC		DIFFERENCE	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0
15	NRLC		% DIFFERENCE	0.0	0.0	-0.07	-0.51	-2.49	-5.08	-8.66	-350.11	12.58	-0.14	0.07
16														
17			EMPLOYMENT (MILLIONS)											
18	NEMT	I	SPR 3	96.403	96.260	97.598	98.539	99.661	100.705	102.681	104.894	107.063	111.597	114.847
19	NEMT	I	NO STRATEGIC RESERVE	96.414	96.315	98.028	98.891	100.095	101.287	102.777	105.110	107.988	112.911	116.212
20	NEMT	I	DIFFERENCE	-0.010	-0.071	-0.431	-0.352	-0.434	-0.581	-0.693	-0.225	-0.981	0.985	0.635
21	NEMT	I	% DIFFERENCE	-0.01	-0.07	-0.44	-0.36	-0.43	-0.57	-0.67	-0.21	-0.89	0.82	0.56
22			% CHANGE											
23	NEMT	I	SPR 3	2.2	-0.2	1.4	1.0	1.1	1.0	1.9	2.0	2.0	3.5	2.7
24	NEMT	I	NO STRATEGIC RESERVE	2.2	-0.1	1.8	0.9	1.2	1.2	1.5	2.3	2.6	2.8	3.0
25	NEMT	I	DIFFERENCE	-0.0	-0.1	-0.4	0.1	-0.1	-0.1	0.3	0.1	0.4	0.7	-0.4
26	NEMT	I	% DIFFERENCE	-0.51	61.25	-20.66	9.61	-8.50	-11.97	20.00	3.20	6.84	24.19	-9.19
27														
28			WAGE RATE PER WEEK, ALL INDUSTRIES											
29	WRCS	I	SPR 3	298.2	319.0	350.8	397.1	442.8	494.3	551.5	612.6	678.4	749.6	828.2
30	WRCS	I	NO STRATEGIC RESERVE	298.2	318.8	353.0	393.8	437.0	485.0	540.1	599.6	663.8	735.8	814.7
31	WRCS	I	DIFFERENCE	0.01	0.2	-1.8	3.3	5.7	8.8	11.1	13.2	14.6	13.8	14.5
32	WRCS	I	% DIFFERENCE	0.01	0.13	0.50	0.84	1.32	1.80	2.06	2.19	2.20	1.88	1.78
33			% CHANGE											
34	WRCS	I	SPR 3	9.2	9.9	11.2	11.9	11.5	11.8	11.5	11.2	10.7	10.5	10.5
35	WRCS	I	NO STRATEGIC RESERVE	9.2	9.8	10.8	11.6	11.0	11.1	11.2	11.0	10.7	10.8	10.6
36	WRCS	I	DIFFERENCE	0.0	0.1	0.4	0.3	0.5	0.6	0.4	0.1	0.0	-0.3	-0.1
37	WRCS	I	% DIFFERENCE	0.14	1.32	3.84	3.21	4.74	6.00	3.54	1.29	0.03	-3.15	-1.00
38														
39			PRODUCTIVITY - ALL INDUSTRIES											
40	GAPPP	I	SPR 3	14.645	14.522	14.838	15.026	15.172	15.321	15.589	15.869	16.230	16.640	16.988
41	GAPPP	I	NO STRATEGIC RESERVE	14.647	14.535	14.900	15.035	15.208	15.367	15.585	15.894	16.256	16.589	16.928
42	GAPPP	I	DIFFERENCE	-0.002	-0.013	-0.062	-0.009	-0.036	-0.047	-0.005	-0.025	-0.019	0.051	0.058
43	GAPPP	I	% DIFFERENCE	-0.01	-0.09	-0.42	-0.06	-0.23	-0.31	0.03	-0.16	-0.12	0.31	0.34
44			% CHANGE											
45	GAPPP	I	SPR 3	1.2	-0.8	2.2	1.3	1.0	1.0	1.8	1.8	2.3	2.5	2.1
46	GAPPP	I	NO STRATEGIC RESERVE	1.2	-0.8	2.5	0.9	1.1	1.1	1.6	2.0	2.2	2.0	2.1
47	GAPPP	I	DIFFERENCE	-0.0	-0.1	-0.3	0.4	-0.2	-0.1	0.3	-0.2	0.0	0.5	-0.1
48	GAPPP	I	% DIFFERENCE	1.22	9.58	-13.40	39.75	-14.65	-7.55	24.00	-9.53	1.76	24.10	-36.51
49														
50			PRODUCTIVITY - ALL MANUFACTURING											
51	XVGMPP	I	SPR 3	8.102	8.321	8.597	8.826	9.080	9.373	9.736	10.106	10.485	10.872	11.179
52	XVGMPP	I	NO STRATEGIC RESERVE	8.105	8.329	8.637	8.825	9.103	9.397	9.721	10.115	10.491	10.863	11.207
53	XVGMPP	I	DIFFERENCE	-0.003	-0.008	-0.040	0.002	-0.017	-0.024	0.011	-0.011	-0.006	0.009	-0.031
54	XVGMPP	I	% DIFFERENCE	-0.04	-0.09	-0.47	0.02	-0.18	-0.25	0.11	-0.11	-0.06	0.08	-0.28

TABLE 1.00 SELECTED INDICATORS

LINE	VAR LABEL		ITEM		1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1				% CHANGE											
2	XVGNPPP	I	SPR 3		1.31	2.7	3.3	2.7	2.9	3.2	3.0	3.0	3.0	3.7	2.8
3	XVGNPPP	I	NO STRATEGIC RESERVE		1.31	2.8	3.7	2.8	3.2	3.2	3.5	4.0	3.7	3.2	3.5
4	XVGNPPP	I	DIFFERENCE		-0.01	-0.1	-0.4	0.5	-0.2	-0.1	0.4	-0.2	0.1	0.5	-0.8
5	XVGNPPP	I	% DIFFERENCE		-1.22	-2.76	-10.56	22.97	-6.01	-2.26	10.91	-5.63	1.51	10.70	-21.46
6			REAL PER CAPITA GNP (THOU 72 $)-----												
7	GNPPC	I	SPR 3		6.488	6.288	6.456	6.539	6.614	6.685	6.758	7.078	7.378	7.758	8.005
8	GNPPC	I	NO STRATEGIC RESERVE		6.610	6.299	6.512	6.569	6.658	6.744	6.875	7.105	7.388	7.679	8.082
9	GNPPC	I	DIFFERENCE		-0.082	-0.010	-0.056	-0.027	-0.044	-0.059	-0.118	-0.026	-0.012	0.079	0.083
10	GNPPC	I	% DIFFERENCE		-0.03	-0.16	-0.85	-0.42	-0.66	-0.88	-0.26	-1.37	-0.16	0.99	0.98
11				% CHANGE											
12	GNPPC	I	SPR 3		0.11	-1.9	2.7	1.3	1.2	1.1	0.9	3.2	4.2	5.1	3.2
13	GNPPC	I	NO STRATEGIC RESERVE		0.11	-1.7	3.4	0.8	1.4	1.3	1.9	3.3	4.0	3.9	5.2
14	GNPPC	I	DIFFERENCE		-0.01	-0.1	-0.7	0.4	-0.2	-0.2	-0.1	0.2	1.2	1.2	-1.9
15	GNPPC	I	% DIFFERENCE		-21.78	7.78	-21.21	53.32	-17.62	-17.23	12.94	-3.54	5.81	30.23	-43.27
16															
17			REAL PER CAP DISP INC (THOU '72 $)-												
18	YPD/NPT		SPR 3		4.475	4.429	4.457	4.506	4.557	4.609	4.749	4.972	5.233	5.519	5.787
19	YPD/NPT		NO STRATEGIC RESERVE		4.477	4.431	4.500	4.532	4.586	4.641	4.760	4.972	5.220	5.485	5.730
20	YPD/NPT		DIFFERENCE		-0.001	-0.001	-0.042	-0.026	-0.029	-0.032	-0.011	-0.000	0.014	0.034	0.057
21	YPD/NPT		% DIFFERENCE		-0.03	-0.03	-0.94	-0.57	-0.63	-0.70	-0.23	-0.00	0.26	1.26	0.84
22				% CHANGE											
23	YPD/NPT		SPR 3		0.81	-1.0	0.8	1.1	1.1	1.1	3.7	4.7	5.3	5.9	4.9
24	YPD/NPT		NO STRATEGIC RESERVE		0.81	-1.0	1.6	0.7	1.2	1.2	2.1	4.5	5.0	5.1	4.5
25	YPD/NPT		DIFFERENCE		-0.01	-0.2	-0.7	0.4	-0.1	-0.1	0.5	0.2	0.4	1.1	0.7
26	YPD/NPT		% DIFFERENCE		-5.41	19.48	-40.33	62.53	-6.76	-8.52	29.84	5.36	9.51	24.30	19.22
27															
28			CORPORATE PROFITS BEFORE TAXES-----												
29	CPUBTS	I	SPR 3		217.71	218.1	270.2	311.5	341.0	386.8	447.9	482.8	536.0	614.7	675.1
30	CPUBTS	I	NO STRATEGIC RESERVE		217.31	215.5	273.2	308.3	330.2	375.6	430.7	466.7	504.1	617.0	708.2
31	CPUBTS	I	DIFFERENCE		0.41	2.6	-3.0	3.2	10.8	11.2	17.1	16.0	31.9	-2.3	-33.1
32	CPUBTS	I	% DIFFERENCE		0.181	1.22	2.20	3.72	3.26	2.97	3.98	-0.01	-2.03	-0.32	-3.86
33				% CHANGE											
34	CPUBTS	I	SPR 3		9.71	0.2	24.0	11.5	9.5	13.0	15.8	7.8	10.4	13.1	12.9
35	CPUBTS	I	NO STRATEGIC RESERVE		9.61	-0.8	26.8	9.9	10.0	13.7	14.7	13.0	12.2	13.0	13.9
36	CPUBTS	I	DIFFERENCE		0.01	1.0	1.2	1.6	-0.5	-0.8	1.1	-5.2	-1.8	0.1	-1.0
37	CPUBTS	I	% DIFFERENCE		4.17	120.77	4.61	16.61	-4.88	-6.16	7.64	-40.01	-15.09	0.99	-12.93
38															
39			BOND RATE (%)-----												
40	FRMCB	0	SPR 3		10.28	10.86	11.57	12.02	12.25	12.30	12.28	12.09	11.83	10.70	10.39
41	FRMCB	0	NO STRATEGIC RESERVE		10.28	10.79	11.34	11.66	11.85	11.95	11.98	11.77	11.29	10.88	10.67
42	FRMCB	0	DIFFERENCE		-0.00	0.05	0.23	0.36	0.40	0.35	0.29	0.31	0.54	-0.18	-0.28
43	FRMCB	0	% DIFFERENCE		-0.00	0.45	2.02	3.08	3.36	2.79	2.37	2.58	4.84	-1.66	-2.65
44			PRIME COMMERCIAL PAPER RATE (%)----												
45	FRMCPAM	0	SPR 3		11.01	11.01	11.66	11.13	10.80	10.67	10.51	9.79	9.06	9.06	9.57
46	FRMCPAM	0	NO STRATEGIC RESERVE		11.01	10.84	11.08	10.82	10.60	10.57	10.39	9.92	9.17	9.06	9.66
47	FRMCPAM	0	DIFFERENCE		-0.00	0.17	0.58	0.31	0.21	0.09	0.12	-0.13	-0.10	-0.00	-0.09
48	FRMCPAM	0	% DIFFERENCE		-0.00	1.57	5.22	2.85	1.96	0.77	1.16	-1.34	-1.17	-0.77	-0.90
49			MONEY SUPPLY-----												
50	FM2B	I	SPR 3		1030.3	1122.0	1221.3	1303.3	1330.0	1089.0	1895.9	2170.0	2511.7	2919.3	3379.4
51	FM2B	I	NO STRATEGIC RESERVE		1030.2	1122.7	1225.0	1314.3	1327.7	1885.0	1888.1	2150.0	2487.0	2868.9	3281.1
52	FM2B	I	DIFFERENCE		0.1	-0.3	-3.6	-11.0	3.1	4.0	7.9	20.0	24.1	50.4	98.3
53	FM2B	I	% DIFFERENCE		0.01	-0.02	-0.30	-0.79	0.20	0.25	0.49	1.59	1.79	2.04	3.09

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL

SPR3

NO SPR

TABLE 2.00 GROSS NATIONAL PRODUCT (ST2)

LINE	VAR	LABEL	I T E M	1979	1981	1981	1982	1983	1984	1985	1986	1987	1988	1989
1														
2			--------CONSTANT 72 DOLLARS--------											
3														
4			GROSS NATIONAL PRODUCT----------	1413.8	1397.7	1448.1	1480.0	1510.0	1568.9	1597.0	1660.0	1730.7	1852.0	1928.9
5	GNP		SPR 3----------	1412.2	1399.9	1448.8	1484.8	1540.1	1598.5	1661.7	1672.8	1743.4	1838.9	1928.2
6	GNP		NO STRATEGIC RESERVE----------	1412.2	1412.5	1461.5	1495.0	1550.7	1608.7	1661.1	1693.0	1743.4	1838.9	1928.2
7	GNP		DIFFERENCE ----------	+0.001	+12.5	+12.5	+10.0	+10.7	+10.1	+0.0	+20.2	+0.0	0.00	0.00
8	GNP		% DIFFERENCE ----------	+0.001	+0.89	+0.85	+0.68	+0.68	+0.63	+0.00	+0.57	+0.00	0.00	0.00
9			% CHANGE											
10	GNP		SPR 3----------	0.00	-1.0	3.6	2.2	3.1	3.8	2.0	4.0	4.2	6.3	5.0
11	GNP		NO STRATEGIC RESERVE----------	0.00	-1.0	3.6	2.2	3.1	3.8	2.0	4.0	4.2	6.3	5.0
12	GNP		DIFFERENCE ----------	+0.001	19.50	-10.68	25.02	-10.58	+0.00	22.22	-0.76	0.57	20.00	-10.00
13	GNP		% DIFFERENCE ----------	+0.001										
14														
15			PERSONAL CONSUMPTION EXPENDITURES--	911.0	903.1	941.0	966.1	999.7	1039.0	1058.9	1094.0	1112.7	1183.0	1240.0
16	CE		SPR 3----------	911.0	904.1	948.1	967.1	998.0	1037.1	1058.1	1098.0	1111.6	1178.7	1240.0
17	CE		NO STRATEGIC RESERVE----------	911.0	911.0	950.1	968.0	999.7	1038.1	1058.1	1098.0	1111.6	1178.7	1240.0
18	CE		DIFFERENCE ----------	+0.001	+7.0	+2.0	+0.9	+1.7	+1.0	0.00	0.00	0.00	0.00	0.00
19	CE		% DIFFERENCE ----------	+0.001	+0.77	+0.21	+0.09	+0.17	+0.10	0.00	0.00	0.00	0.00	0.00
20			% CHANGE											
21	CE		SPR 3----------	1.20	-0.9	2.0	2.0	3.1	3.0	2.0	3.0	3.0	6.3	5.0
22	CE		NO STRATEGIC RESERVE----------	1.20	-0.0	4.0	2.0	3.2	3.0	2.0	3.0	3.0	6.3	5.0
23	CE		DIFFERENCE ----------	+0.001	10.03	+0.00	10.00	+11.19	+0.10	19.00	0.00	0.00	0.00	+0.00
24	CE		% DIFFERENCE ----------	+0.001										
25														
26			DURABLE GOODS----------	142.0	136.0	140.0	143.1	148.0	160.0	150.0	162.0	170.0	180.0	190.0
27	CED		SPR 3----------	142.0	136.0	142.0	144.0	149.0	160.0	150.0	162.0	170.0	180.0	190.0
28	CED		NO STRATEGIC RESERVE----------	142.0	136.0	142.0	144.0	149.0	160.0	150.0	162.0	170.0	180.0	190.0
29	CED		DIFFERENCE ----------	+0.001	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	0.00	0.00	0.00
30	CED		% DIFFERENCE ----------	+0.001	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	0.00	0.00	0.00
31			% CHANGE											
32	CED		SPR 3----------	-2.7	-4.7	0.1	3.0	-0.0	0.0	3.0	3.0	10.0	10.0	10.0
33	CED		NO STRATEGIC RESERVE----------	-2.0	-4.3	5.0	2.0	-0.0	0.0	3.0	3.0	10.0	10.0	10.0
34	CED		DIFFERENCE ----------	+0.0	+0.4	-4.9	0.8	-0.0	0.0	0.0	0.0	0.0	0.0	0.00
35	CED		% DIFFERENCE ----------	0.00	7.84	-97.99	50.00	-100.00	-0.07	110.72	0.00	0.00	0.00	0.00
36														
37			NONDURABLE GOODS----------	342.7	339.0	342.2	345.9	349.1	355.9	360.0	372.0	388.0	407.0	422.0
38	CEN		SPR 3----------	342.0	339.0	342.2	347.0	351.0	360.0	360.0	372.0	388.0	407.0	422.0
39	CEN		NO STRATEGIC RESERVE----------	+0.11	+0.5	+0.0	+1.1	+2.01	+0.11	+0.17	+0.01	0.01	0.00	0.00
40	CEN		DIFFERENCE ----------	+0.02	+0.13	+0.57	+0.48	+0.01	+0.11	+0.17	+0.01	0.01	0.00	0.00
41	CEN		% DIFFERENCE ----------											
42			% CHANGE											
43	CEN		SPR 3----------	+0.01	-1.1	1.0	1.1	0.9	1.1	3.1	3.3	4.0	5.7	4.0
44	CEN		NO STRATEGIC RESERVE----------	+0.01	-1.1	1.0	1.1	1.1	1.1	3.1	3.3	4.0	5.7	4.0
45	CEN		DIFFERENCE ----------	+0.01	+0.1	-0.0	0.01	+0.01	+0.01	19.07	0.00	0.01	10.72	+0.00
46	CEN		% DIFFERENCE ----------	12.17	11.58	-31.67	0.00	+0.03	+0.01					
47														
48			SERVICES----------	420.1	420.5	430.1	450.1	469.6	480.0	490.1	510.7	540.1	570.0	600.0
49	CES		SPR 3----------	420.1	420.5	430.1	451.2	467.1	482.1	490.9	520.1	540.7	571.0	600.0
50	CES		NO STRATEGIC RESERVE----------	420.1	421.6	431.7	451.1	470.0	481.9	490.8	520.1	540.7	571.0	600.0
51	CES		DIFFERENCE ----------	+0.01	+0.99	+0.58	+0.24	+0.34	+0.39	+0.10	+0.07	0.07	0.00	0.00
52	CES		% DIFFERENCE ----------	+0.01										

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
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NO SPR

TABLE 2.00 GROSS NATIONAL PRODUCT (072)

LINE	VAR	LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1			% CHANGE											
2	CE0	1	SPR	3.71	0.8	2.2	3.0	3.0	3.1	3.7	0.4	0.7	3.5	3.9
3	CE0	1	NO STRATEGIC RESERVE	3.71	0.9	2.5	2.8	3.1	3.2	3.7	0.4	0.7	3.5	3.9
4	CE0	1	DIFFERENCE	+0.01	-0.1	-0.3	0.2	-0.1	-0.1	0.0	0.0	0.1	0.0	-0.0
5	CE0	1	% DIFFERENCE	+0.37	-8.70	-11.89	5.31	-3.27	-1.64	0.00	2.14	8.17	10.89	+4.97
6			GROSS PRIVATE DOMESTIC INVESTMENT											
7	IB7	1	SPR	209.01	190.2	213.0	219.0	229.1	236.0	239.0	236.1	242.3	313.0	343.3
8	IB7	1	NO STRATEGIC RESERVE	209.01	190.7	215.0	219.0	229.0	236.0	239.0	236.1	242.3	313.0	343.3
9	IB7	1	DIFFERENCE	0.01	+0.5	+2.0	+0.0	-0.1	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0
10	IB7	1	% DIFFERENCE	0.01	+0.30	+2.01	+0.20	-1.20	+2.05	0.00	-1.01	+0.05	1.07	0.00
11			% CHANGE											
12	IB7	1	SPR	+8.21	+9.3	10.0	0.3	4.6	+0.0	0.2	7.0	10.0	11.0	0.3
13	IB7	1	NO STRATEGIC RESERVE	+8.21	+9.0	10.0	0.0	3.0	3.1	0.2	8.0	9.2	7.0	0.0
14	IB7	1	DIFFERENCE	0.01	+0.3	+0.0	0.3	-1.0	-3.1	0.0	-1.1	3.1	0.0	+0.0
15	IB7	1	% DIFFERENCE	+0.33	3.10	-17.09	+++++	-20.20	-103.03	01.96	-14.02	11.01	50.00	+0.00
16														
17			FIXED INVESTMENT											
18	IBF	1	SPR	199.01	187.0	200.0	210.0	218.7	211.0	222.0	227.1	250.3	283.7	299.1
19	IBF	1	NO STRATEGIC RESERVE	199.71	188.0	211.5	213.5	218.7	217.0	223.7	240.1	259.1	275.7	293.3
20	IBF	1	DIFFERENCE	+0.6	+0.0	+1.1	+3.5	0.0	+1.1	+1.0	+0.0	+0.0	0.0	0.1
21	IBF	1	% DIFFERENCE	+0.33	+0.31	+2.10	+0.50	-1.00	+2.57	+0.47	+1.06	+0.32	2.92	0.02
22			% CHANGE											
23	IBF	1	SPR	+0.3	+5.0	10.0	0.0	0.0	+1.1	5.1	0.0	0.0	0.0	0.0
24	IBF	1	NO STRATEGIC RESERVE	+0.31	+0.0	12.0	1.0	0.0	0.0	3.1	7.0	8.0	7.0	0.0
25	IBF	1	DIFFERENCE	+0.01	+0.0	1.0	+0.0	+0.0	2.0	2.0	7.0	8.0	7.0	0.0
26	IBF	1	% DIFFERENCE	12.05	0.02	-10.13	191.02	-01.20	+973.59	72.00	-11.01	14.10	94.07	+0.00
27														
28			NONRESIDENTIAL											
29	IBFN	1	SPR	149.0	140.2	150.0	151.7	158.0	155.1	159.0	160.1	180.3	196.0	210.7
30	IBFN	1	NO STRATEGIC RESERVE	149.7	140.0	151.2	153.0	158.7	158.1	162.3	171.2	182.5	196.0	210.9
31	IBFN	1	DIFFERENCE	+0.0	+0.2	+1.2	+1.3	+0.3	+0.0	+0.0	+0.1	+0.2	0.0	+0.2
32	IBFN	1	% DIFFERENCE	+0.02	+0.14	+0.81	+0.84	+1.50	+1.99	+1.74	+1.00	+1.19	0.10	+0.12
33			% CHANGE											
34	IBFN	1	SPR	0.0	+1.0	0.0	1.1	3.1	1.1	0.0	0.0	7.0	9.1	7.0
35	IBFN	1	NO STRATEGIC RESERVE	0.0	+0.9	0.7	1.0	3.0	1.0	0.7	0.0	0.0	7.0	7.0
36	IBFN	1	DIFFERENCE	+0.0	+0.1	+0.0	+0.7	+0.0	+0.0	+0.2	+0.1	0.7	2.0	+0.0
37	IBFN	1	% DIFFERENCE	+0.50	14.09	-14.89	+0.24	-37.62	-20.77	9.50	+1.13	9.92	10.40	+0.07
38														
39			RESIDENTIAL STRUCTURES											
40	IBFR	1	SPR	50.0	48.0	50.0	50.0	50.3	50.1	50.1	49.2	70.0	87.1	90.7
41	IBFR	1	NO STRATEGIC RESERVE	50.0	48.0	50.3	50.0	51.0	50.0	51.3	49.2	70.7	90.1	92.3
42	IBFR	1	DIFFERENCE	+0.0	+0.0	+0.0	0.2	+0.7	+0.0	1.0	0.1	1.3	2.0	0.3
43	IBFR	1	% DIFFERENCE	+0.07	+0.07	+0.05	0.14	+1.15	+0.00	2.00	0.04	1.70	0.90	0.30
44			% CHANGE											
45	IBFR	1	SPR	-10.2	-19.1	09.7	7.1	+0.0	+0.3	10.0	9.7	10.7	11.7	+9.1
46	IBFR	1	NO STRATEGIC RESERVE	-10.1	-10.5	10.9	0.7	+0.0	0.1	12.0	10.0	3.0	3.0	3.9
47	IBFR	1	DIFFERENCE	+0.1	+0.7	0.1	0.0	+0.0	0.2	2.0	+0.1	1.0	0.0	+0.0
48	IBFR	1	% DIFFERENCE	0.50	3.54	-10.39	109.47	-229.80	90.01	190.90	+20.10	17.07	240.00	+0.32
49														
50			CHANGE IN BUSINESS INVENTORIES											
51	IBIT	1	SPR	10.0	0.3	7.2	9.3	10.0	14.0	13.3	10.0	09.0	09.7	10.1
52	IBIT	1	NO STRATEGIC RESERVE	9.9	2.3	7.9	9.0	10.1	12.0	13.0	10.0	03.0	09.7	10.0
53	IBIT	1	DIFFERENCE	0.11	0.0	+0.7	0.3	0.3	+0.1	1.3	0.0	0.7	0.1	+0.0
54	IBIT	1	% DIFFERENCE	0.791	0.00	+0.07	3.00	0.01	+0.01	10.07	0.00	0.07	11.01	+0.00

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL

TABLE 2.00 GROSS NATIONAL PRODUCT (GT2)

LINE	VAR LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1	GNP	STATE OF CONTROL											
2	GNP	CONSTANT $											
3	GNP STRATEGIC RESERVE												
4	DIFFERENCE												
5	GNP STRATEGIC RESERVE												
6	DIFFERENCE												
7	GNP STRATEGIC RESERVE												
8	DIFFERENCE												
9	GNP STRATEGIC RESERVE												
10	DIFFERENCE												

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR7
NO SPR

TABLE 2.00 GROSS NATIONAL PRODUCT (872)

LINE	VAR	LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1			NET EXPORTS OF GOODS AND SERVICES											
2	TBB		SPR 7	15.61	26.8	32.0	36.8	38.6	40.0	49.6	48.8	31.8	28.3	33.6
3	TBB		NO STRATEGIC RESERVE	15.61	25.3	31.7	33.8	36.3	40.8	49.1	48.4	39.7	38.1	38.6
4	TBB		DIFFERENCE	-0.21	0.9	1.2	3.0	2.3	-.1	.7	.4	-7.9	-9.8	-4.9
5	TBB		% DIFFERENCE	-1.05	3.64	3.76	2.47	6.55	10.30	7.96	+0.83	-19.87	-31.96	-38.38
6														
7			EXPORTS											
8	TEB		SPR 7	118.01	129.5	141.3	147.0	155.8	167.7	179.8	177.0	176.8	188.3	198.9
9	TEB		NO STRATEGIC RESERVE	118.71	127.8	138.6	144.3	153.8	169.8	171.1	175.3	180.1	190.7	200.7
10	TEB		DIFFERENCE	-0.71	1.7	2.6	2.7	2.0	-2.2	8.7	1.8	-3.3	-2.4	-1.8
11	TEB		% DIFFERENCE	-0.59	1.34	1.90	1.86	1.27	9.13	5.06	0.88	-2.07	-1.89	-.83
12			% CHANGE											
13	TEB		SPR 7	8.91	9.1	9.1	9.1	9.0	7.6	7.2	7.5	7.8	8.7	9.3
14	TEB		NO STRATEGIC REVERSE	9.01	7.7	8.5	9.1	9.5	9.7	7.1	2.5	2.7	5.9	5.1
15	TEB		DIFFERENCE	-0.11	1.5	0.6	-0.0	1.4	1.9	-0.1	-0.1	-0.1	-0.2	-1.1
16	TEB		% DIFFERENCE	-0.72	19.12	7.58	-0.19	30.99	33.36	-1.01	-160.21	-10.68	-33.33	-19.31
17														
18			IMPORTS											
19	TMB		SPR 7	103.2	103.2	109.4	110.8	117.2	123.8	130.0	137.0	144.6	156.0	171.0
20	TMB		NO STRATEGIC RESERVE	103.1	102.5	107.0	110.9	114.6	119.2	125.0	132.6	140.4	151.0	166.0
21	TMB		DIFFERENCE	0.1	0.7	1.4	1.9	2.6	4.6	5.0	4.4	4.2	5.0	5.0
22	TMB		% DIFFERENCE	0.09	0.72	1.35	1.73	2.28	3.59	3.99	3.30	2.99	3.30	2.79
23			% CHANGE											
24	TMB		SPR 7	5.01	0.0	5.0	0.0	5.7	5.2	5.0	5.4	5.5	8.0	9.3
25	TMB		NO STRATEGIC RESERVE	5.01	0.0	4.3	3.6	3.3	4.1	4.9	6.1	5.8	7.6	9.9
26	TMB		DIFFERENCE	0.1	0.0	0.7	-3.6	2.3	1.1	0.0	-0.7	-0.3	0.4	-0.6
27	TMB		% DIFFERENCE	1.79	103.76	16.82	19.56	17.37	27.29	12.97	-11.51	-6.00	6.48	-5.96
28														
29			GOVT PURCH OF GOODS AND SERVICES											
30	GVPT		SPR 7	275.2	279.2	281.5	286.7	293.0	299.5	306.1	312.7	319.6	326.9	334.6
31	GVPT		NO STRATEGIC RESERVE	275.2	279.2	281.5	286.7	293.0	299.5	306.1	312.7	319.6	326.9	334.6
32	GVPT		DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	GVPT		% DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34			% CHANGE											
35	GVPT		SPR 7	0.7	1.4	0.8	1.8	2.2	2.2	2.2	2.2	2.2	2.3	2.3
36	GVPT		NO STRATEGIC RESERVE	0.7	1.4	0.8	1.8	2.2	2.2	2.2	2.2	2.2	2.3	2.3
37	GVPT		DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	GVPT		% DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39														
40			FEDERAL											
41	GVPF		SPR 7	100.9	102.9	104.3	106.5	108.7	111.0	113.3	115.7	118.1	120.7	123.1
42	GVPF		NO STRATEGIC RESERVE	100.9	102.9	104.3	106.5	108.7	111.0	113.3	115.7	118.1	120.7	123.1
43	GVPF		DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44	GVPF		% DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45			% CHANGE											
46	GVPF		SPR 7	2.3	2.0	1.3	2.1	2.1	2.1	2.0	2.1	2.0	2.2	2.0
47	GVPF		NO STRATEGIC RESERVE	2.3	2.0	1.3	2.1	2.1	2.1	2.0	2.1	2.0	2.2	2.0
48	GVPF		DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	GVPF		% DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR7
NO SPR

TABLE 2.00 GROSS NATIONAL PRODUCT ($72)

LINE	VAR	LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1			STATE AND LOCAL											
2	GVPS	I	SPR 7	174.3	176.3	177.2	180.2	184.2	188.4	192.8	197.0	201.6	206.2	210.9
3	GVPS	I	NO STRATEGIC RESERVE	174.3	176.3	177.2	180.2	184.2	188.4	192.8	197.0	201.6	206.2	210.9
4	GVPS	I	DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	GVPS	I	% DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6			% CHANGE											
7	GVPS	I	SPR 7	-0.2	1.1	0.5	1.7	2.2	2.3	2.3	2.2	2.3	2.3	2.3
8	GVPS	I	NO STRATEGIC RESERVE	-0.2	1.1	0.5	1.7	2.2	2.3	2.3	2.2	2.3	2.3	2.3
9	GVPS	I	DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	GVPS	I	% DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR11
NO SPR

TABLE 1.00 SELECTED INDICATORS

LINE	VAR	LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1			GROSS NATIONAL PRODUCT (CUR $)------											
2	GNPS	I	SPR 11----------	2340.0	2553.2	2917.8	3301.7	3693.1	4102.9	4761.8	5358.6	6072.5	6895.8	7759.4
3	GNPS	I	NO STRATEGIC RESERVE----------	2340.5	2547.2	2905.1	3246.1	3623.8	4051.2	4592.6	5199.0	5853.7	6649.1	7561.2
4	GNPS	I	DIFFERENCE ----------	-0.4	6.0	12.8	55.6	69.3	131.7	169.1	159.6	218.9	235.8	194.1
5	GNPS	I	% DIFFERENCE ----------	-0.021	0.24	0.44	1.71	1.91	3.25	4.16	3.86	3.74	3.55	2.57
6			% CHANGE											
7	GNPS	I	SPR 11----------	10.0	9.1	14.3	13.2	11.9	13.3	13.4	13.0	13.3	13.6	12.9
8	GNPS	I	NO STRATEGIC RESERVE----------	10.0	8.8	14.0	11.7	11.6	11.8	12.6	13.2	12.6	13.6	13.7
9	GNPS	I	DIFFERENCE ----------	+0.0	0.3	0.2	1.4	0.2	1.5	0.8	-0.3	+0.1	+0.0	-0.8
10	GNPS	I	% DIFFERENCE ----------	-0.00	3.12	1.65	12.06	1.80	12.85	7.09	-2.48	+0.96	-1.55	-7.85
11														
12			GROSS NATIONAL PRODUCT (72 $)------											
13	GNP	I	SPR 11----------	1411.0	1387.1	1461.1	1476.8	1502.5	1546.8	1608.7	1667.2	1749.5	1866.2	1935.0
14	GNP	I	NO STRATEGIC RESERVE----------	1412.0	1399.9	1466.6	1488.8	1522.1	1558.5	1601.7	1670.8	1751.4	1858.9	1933.2
15	GNP	I	DIFFERENCE ----------	-0.8	-12.8	-19.5	-10.8	-19.6	-10.5	+0.8	-3.3	-1.8	7.3	1.8
16	GNP	I	% DIFFERENCE ----------	-0.05	-0.92	-1.34	-0.73	-1.29	-0.68	+0.05	-0.21	-0.12	0.39	0.10
17			% CHANGE											
18	GNP	I	SPR 11----------	0.0	-1.8	3.9	2.0	1.8	2.9	3.9	4.1	4.9	5.4	5.0
19	GNP	I	NO STRATEGIC RESERVE----------	0.0	-0.9	4.3	1.8	2.4	2.3	2.8	4.3	4.9	6.1	4.0
20	GNP	I	DIFFERENCE ----------	+0.0	-0.9	-0.4	0.2	-0.6	-0.4	+0.2	-0.2	+0.0	-0.8	+0.9
21	GNP	I	% DIFFERENCE ----------	-2.81	101.85	-10.22	31.26	-20.34	27.07	22.25	-3.43	-0.17	10.98	-3.01
22														
23			GROSS NAT. PROD. DEFL. (1972=100.0)											
24	PDGNP	I	SPR 11----------	165.7	184.1	202.5	223.7	245.8	270.6	296.2	321.4	347.1	372.3	400.7
25	PDGNP	I	NO STRATEGIC RESERVE----------	165.7	182.0	198.0	218.1	238.1	260.3	286.2	310.8	333.8	361.0	391.1
26	PDGNP	I	DIFFERENCE ----------	0.01	2.1	3.6	5.6	7.7	10.3	12.0	12.6	13.2	11.3	9.6
27	PDGNP	I	% DIFFERENCE ----------	0.011	1.16	1.80	2.65	3.24	3.95	4.21	4.06	3.97	3.28	2.46
28			% CHANGE											
29	PDGNP	I	SPR 11----------	0.0	11.1	10.0	10.5	9.9	10.1	9.5	9.5	8.0	7.6	7.6
30	PDGNP	I	NO STRATEGIC RESERVE----------	0.0	9.8	8.8	9.8	9.2	9.3	9.2	8.6	8.1	8.2	8.2
31	PDGNP	I	DIFFERENCE ----------	0.0	1.3	0.7	0.7	0.8	0.8	0.3	+0.1	+0.1	-0.7	-0.6
32	PDGNP	I	% DIFFERENCE ----------	0.00	12.97	7.40	7.30	8.23	8.13	3.67	-1.07	-1.40	+9.02	-10.14
33														
34			POPULATION (MILLIONS)------											
35	NPT	I	SPR 11----------	220.31	222.84	225.37	226.43	228.48	230.79	232.97	235.17	237.33	239.48	241.58
36	NPT	I	NO STRATEGIC RESERVE----------	220.31	222.84	225.37	226.43	228.48	230.79	232.97	235.17	237.33	239.48	241.58
37	NPT	I	DIFFERENCE ----------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	NPT	I	% DIFFERENCE ----------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39			% CHANGE											
40	NPT	I	SPR 11----------	0.0	0.0	0.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9
41	NPT	I	NO STRATEGIC RESERVE----------	0.0	0.0	0.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9
42	NPT	I	DIFFERENCE ----------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43	NPT	I	% DIFFERENCE ----------	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44														
45			LABOR FORCE (MILLIONS)------											
46	NLC	I	SPR 11----------	102.81	105.09	106.89	108.35	109.76	111.80	113.10	113.30	114.37	115.07	115.11
47	NLC	I	NO STRATEGIC RESERVE----------	102.81	105.09	106.89	108.36	109.78	111.84	113.25	113.38	114.46	115.94	116.15
48	NLC	I	DIFFERENCE ----------	0.0	0.0	+0.00	+0.01	+0.02	+0.04	+0.06	+0.08	+0.09	+0.87	+0.04
49	NLC	I	% DIFFERENCE ----------	0.0	0.0	+0.00	+0.01	+0.02	+0.04	+0.06	+0.07	+0.08	+0.08	+0.03

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL

SPR11

NO SPR

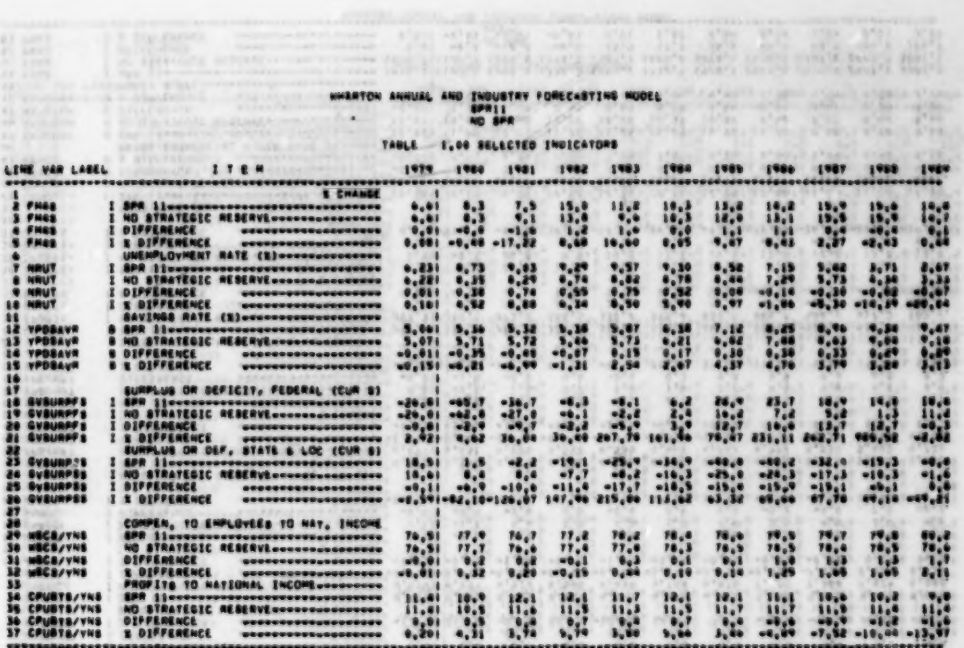
TABLE 1.60 SELECTED INDICATORS

LINE	VAR	LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
			% CHANGE											
3	NLC		SPR 11	2.0	2.2	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
5	NLC		NO STRATEGIC RESERVE	2.0	2.2	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
6	NLC		DIFFERENCE	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
9	NLC		% DIFFERENCE	0.0	0.0	-0.00	-0.00	-0.07	-0.09	-0.02	-0.01	-0.05	1.09	1.00
6			PARTICIPATION RATE											
7	NRLC+		SPR 11	63.0	64.1	64.6	64.5	64.7	64.8	64.9	64.8	64.8	65.1	65.3
8	NRLC+		NO STRATEGIC RESERVE	63.0	64.1	64.6	64.5	64.7	64.8	64.9	64.8	64.8	65.1	65.3
9	NRLC+		DIFFERENCE	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
10	NRLC+		% DIFFERENCE	0.0	0.0	-0.00	-0.01	-0.04	-0.04	-0.04	-0.07	-0.04	-0.04	-0.03
11			% CHANGE											
12	NRLC+		SPR 11	0.7	0.8	0.4	0.2	0.4	0.2	0.1	+0.0	+0.1	0.3	1.0
13	NRLC+		NO STRATEGIC RESERVE	0.7	0.8	0.4	0.2	0.4	0.2	0.1	0.0	+0.1	0.3	1.0
14	NRLC+		DIFFERENCE	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0	0.0
15	NRLC+		% DIFFERENCE	0.0	0.0	-2.38	-0.0	-0.07	-15.0	-479.2	-0.0	0.0	1.01	2.00
16														
17			EMPLOYMENT (MILLIONS)											
18	NEMT		SPR 11	96.403	95.919	97.201	98.285	99.253	100.075	102.020	103.195	104.100	105.111	106.110
19	NEMT		NO STRATEGIC RESERVE	96.810	96.315	98.128	99.091	100.095	101.207	102.770	104.195	105.110	107.100	108.211
20	NEMT		DIFFERENCE	-0.406	-0.396	-0.928	-0.805	-0.842	-0.810	-0.749	-0.977	-0.990	-0.988	-0.911
21	NEMT		% DIFFERENCE	-0.01	-0.01	-0.00	-0.01	-0.04	-0.00	-0.15	0.07	0.09	0.09	0.08
22			% CHANGE											
23	NEMT		SPR 11	2.0	+0.5	1.3	1.1	1.0	1.0	1.9	2.0	2.0	2.1	2.0
24	NEMT		NO STRATEGIC RESERVE	2.0	+0.1	1.8	1.0	1.0	1.0	1.9	2.0	2.0	2.1	2.0
25	NEMT		DIFFERENCE	-0.0	+0.0	-0.0	+0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	NEMT		% DIFFERENCE	-0.51	391.57	-22.52	22.10	-19.16	29.30	31.90	0.01	0.00	12.06	2.04
27														
28			AVGE HRLY EARNINGS, ALL INDUSTRIES											
29	WRCE		SPR 11	290.2	321.0	350.0	403.2	451.0	500.0	565.0	627.3	697.2	769.0	844.3
30	WRCE		NO STRATEGIC RESERVE	290.2	318.0	353.0	393.0	437.0	485.0	548.1	599.3	663.0	730.0	812.7
31	WRCE		DIFFERENCE	0.0	2.0	3.0	10.0	14.0	20.0	23.7	27.9	33.0	39.0	31.6
32	WRCE		% DIFFERENCE	0.01	0.76	1.02	2.50	3.36	4.01	0.36	0.00	5.04	5.00	3.03
33			% CHANGE											
34	WRCE		SPR 11	9.2	10.6	11.9	12.0	12.0	10.8	11.0	11.0	11.0	10.0	10.0
35	WRCE		NO STRATEGIC RESERVE	9.2	9.8	10.8	11.0	11.0	11.1	11.0	11.0	10.7	10.0	10.0
36	WRCE		DIFFERENCE	0.0	0.8	0.7	1.0	1.0	0.1	0.0	0.0	0.1	+0.0	0.0
37	WRCE		% DIFFERENCE	0.10	8.35	6.01	9.00	9.95	1.08	0.01	2.10	0.04	-0.00	-0.11
38														
39			PRODUCTIVITY - ALL INDUSTRIES											
40	OUPPD		SPR 11	10.001	10.001	10.010	15.010	15.130	15.280	15.509	15.807	16.170	16.530	16.930
41	OUPPD		NO STRATEGIC RESERVE	10.007	10.535	10.900	15.035	15.200	15.267	15.505	15.894	16.250	16.500	16.900
42	OUPPD		DIFFERENCE	+0.002	+0.074	+0.080	+0.017	+0.000	+0.011	0.014	+0.005	+0.075	+0.030	+0.090
43	OUPPD		% DIFFERENCE	-0.01	+0.51	+0.54	+0.11	+0.07	+0.01	0.09	+0.00	+0.00	+0.10	+0.53
44			% CHANGE											
45	OUPPD		SPR 11	+1.0	+1.3	0.5	1.0	0.0	1.0	1.0	0.1	0.0	0.1	1.7
46	OUPPD		NO STRATEGIC RESERVE	+1.0	+0.0	0.5	0.0	1.1	1.1	1.0	0.0	0.0	0.0	0.1
47	OUPPD		DIFFERENCE	+0.0	+0.0	+0.0	+0.0	-0.1	0.0	+0.0	+0.0	0.0	0.0	0.0
48	OUPPD		% DIFFERENCE	1.22	03.06	-1.27	07.05	09.00	35.90	11.05	-19.10	+0.00	0.10	-11.53
49														
50			PRODUCTIVITY - ALL MANUFACTURING											
51	XUGMPD		SPR 11	8.102	8.270	8.501	8.819	9.047	9.004	9.751	10.109	10.469	10.810	11.177
52	XUGMPD		NO STRATEGIC RESERVE	8.102	8.320	8.637	8.823	9.103	9.307	9.721	10.115	10.491	10.843	11.207
53	XUGMPD		DIFFERENCE	+0.001	-0.050	-0.054	-0.005	-0.036	0.000	0.030	-0.006	-0.022	+0.007	+0.030
54	XUGMPD		% DIFFERENCE	+0.01	+0.01	+0.03	+0.06	+0.00	0.07	0.31	+0.06	+0.21	+0.07	+0.26

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR II
NO SPR

TABLE 1.09 SELECTED INDICATORS

LINE	VAR LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1		% CHANGE											
2	XUSMPSP	I SPR II	1.31	0.2	3.7	3.7	3.6	3.7	3.7	3.6	3.6	3.3	3.6
5	XUSMPSP	I NO STRATEGIC RESERVE	1.31	0.0	3.7	3.8	3.8	3.9	3.9	3.9	3.7	3.8	3.8
4	XUSMPSP	I DIFFERENCE	+0.01	+0.0	+0.0	0.0	+0.0	0.0	0.0	+0.0	+0.0	0.0	+0.0
5	XUSMPSP	I % DIFFERENCE	+1.282	+21.73	+0.56	24.76	+10.99	14.89	7.71	+0.88	+0.10	4.98	+0.70
6		REAL PER CAPITA GNP (THOU 72 $)----											
7	GNPPC	I SPR II	6.4000	6.2841	6.4621	6.5119	6.5731	6.6499	6.8372	7.0490	7.2572	7.4701	6.6810
8	GNPPC	I NO STRATEGIC RESERVE	6.4101	6.2999	6.5121	6.5566	6.6560	6.7466	6.8975	7.1055	7.3088	7.5179	6.6982
9	GNPPC	I DIFFERENCE	+0.0101	+0.0158	+0.0499	+0.0446	+0.0986	+0.0966	+0.0604	+0.0615	+0.0516	0.0478	0.0172
10	GNPPC	I % DIFFERENCE	+0.035	+0.92	+1.30	+0.73	+1.29	+0.88	+0.55	+0.81	+0.82	0.69	0.18
11		% CHANGE											
12	GNPPC	I SPR II	0.11	+0.0	2.9	1.3	0.8	1.9	2.0	3.2	0.3	0.3	0.3
13	GNPPC	I NO STRATEGIC RESERVE	0.11	+1.7	3.4	0.6	1.4	1.3	1.7	3.3	0.3	0.3	+0.6
14	GNPPC	I DIFFERENCE	+0.01	+0.9	+0.6	+0.6	+0.6	0.6	0.3	+0.6	+0.0	0.0	+0.6
15	GNPPC	I % DIFFERENCE	+21.781	50.79	+13.58	79.13	+48.89	48.11	12.98	+0.98	+0.01	13.48	+0.19
16													
17		REAL PER CAP DISP INC (THOU 72 $)--											
18	YPD/NPT	SPR II	4.4751	4.3699	4.4288	4.4864	4.5355	4.6009	4.7599	4.9996	5.2586	5.5448	5.8531
19	YPD/NPT	NO STRATEGIC RESERVE	4.4771	4.3811	4.5389	4.5322	4.5869	4.6611	4.7700	5.0172	5.2688	5.5665	5.8730
20	YPD/NPT	DIFFERENCE	+0.0011	+0.0082	+0.0711	+0.0458	+0.0514	+0.0602	+0.0101	0.0176	0.0102	0.0217	0.0199
21	YPD/NPT	% DIFFERENCE	+0.031	+1.89	+1.59	+1.02	+1.13	+0.89	+0.02	0.04	0.01	0.07	0.07
22		% CHANGE											
23	YPD/NPT	SPR II	0.01	+0.6	1.3	1.3	1.1	2.0	2.9	4.9	5.2	5.3	5.1
24	YPD/NPT	NO STRATEGIC RESERVE	0.01	+1.0	3.6	0.7	1.2	1.6	2.1	4.5	5.0	5.7	5.5
25	YPD/NPT	DIFFERENCE	+0.01	+1.6	+2.2	0.6	+0.1	0.3	0.8	0.3	0.1	0.3	0.3
26	YPD/NPT	% DIFFERENCE	+0.011	30.67	+12.52	81.29	+8.84	20.38	37.92	10.72	3.14	17.34	6.36
27													
28		CORPORATE PROFITS BEFORE TAXES-----											
29	CPUBTS	I SPR II	217.31	220.8	284.6	343.7	369.9	410.5	480.9	488.9	523.1	576.0	619.9
30	CPUBTS	I NO STRATEGIC RESERVE	217.31	219.5	273.2	344.3	359.8	375.0	438.7	486.7	540.1	617.0	768.6
31	CPUBTS	I DIFFERENCE	0.01	+1.3	11.4	+0.6	10.1	35.5	34.2	+2.2	+17.0	+41.0	+148.7
32	CPUBTS	I % DIFFERENCE	0.021	+0.55	4.16	+0.16	2.75	8.66	7.67	+0.44	+3.24	+7.11	+23.98
33		% CHANGE											
34	CPUBTS	I SPR II	9.71	1.3	28.8	20.8	7.6	11.0	17.2	16.9	7.0	9.1	8.3
35	CPUBTS	I NO STRATEGIC RESERVE	9.41	+0.8	24.5	26.0	4.5	16.3	21.7	14.7	11.0	14.2	24.6
36	CPUBTS	I DIFFERENCE	0.21	+0.1	+3.2	5.2	+2.9	5.3	+4.5	+2.2	+3.7	+5.1	+16.3
37	CPUBTS	I % DIFFERENCE	2.171	+97.25	+9.79	24.75	+38.99	29.69	+9.35	+75.61	+28.97	+28.11	+49.87
38													
39		BOND RATE (%)----------											
40	FRMCB	8 SPR II	10.20	11.11	12.05	12.52	12.76	12.76	12.79	12.48	11.87	11.62	11.11
41	FRMCB	8 NO STRATEGIC RESERVE	10.20	10.79	11.36	11.66	11.85	11.85	11.98	11.77	11.25	10.88	10.67
42	FRMCB	8 DIFFERENCE	+0.00	0.32	0.71	0.86	0.91	0.88	0.81	0.71	0.62	0.73	0.44
43	FRMCB	8 % DIFFERENCE	+0.00	2.93	6.26	7.38	7.69	7.45	6.75	6.03	5.49	6.98	4.19
44		PRIME COMMERCIAL PAPER RATE (%)----											
45	FRMCP&M	8 SPR II	11.03	11.95	12.13	11.22	11.28	11.09	10.93	10.26	9.56	9.78	9.66
46	FRMCP&M	8 NO STRATEGIC RESERVE	11.03	10.84	11.08	10.82	10.60	10.37	10.19	9.92	9.17	9.46	9.06
47	FRMCP&M	8 DIFFERENCE	+0.00	1.10	1.04	0.40	0.69	0.72	0.56	0.34	0.40	0.32	0.60
48	FRMCP&M	8 % DIFFERENCE	+0.00	10.10	9.40	3.69	6.47	6.94	5.48	3.38	4.19	3.29	6.22
49		MONEY SUPPLY----------											
50	FM4I	I SPR II	1036.2	1142.3	1207.0	1288.3	1363.1	1702.5	1926.7	2201.0	2550.6	2767.1	3281.8
51	FM4S	I NO STRATEGIC RESERVE	1036.2	1122.7	1225.0	1296.3	1527.7	1685.4	1886.1	2136.0	2467.6	2840.9	3281.1
52	FM4S	I DIFFERENCE	0.1	+0.6	+18.0	+8.0	15.5	17.1	34.6	65.0	82.9	84.2	100.7
53	FM4S	I % DIFFERENCE	0.01	+0.03	+1.47	+0.63	1.01	1.02	2.04	3.04	3.36	3.01	3.07



WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR11
NO SPR

TABLE 1.00 SELECTED INDICATORS

LINE	VAR	LABEL	I T E M	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1			% CHANGE											
2	FM48	I	SPR 11	6.40	8.3	7.5	15.8	11.6	10.3	13.8	16.2	15.9	15.8	16.0
3	FM48	I	NO STRATEGIC RESERVE	6.40	8.3	9.1	13.8	9.6	10.3	12.9	15.1	15.5	15.8	16.1
4	FM48	I	DIFFERENCE	0.01	-0.0	-1.6	1.2	1.6	0.0	1.1	1.1	0.4	-0.0	-0.1
5	FM48	I	% DIFFERENCE	0.00	-0.48	-17.32	8.68	16.60	0.05	9.07	6.43	2.37	-0.03	-0.68
6			UNEMPLOYMENT RATE (%)											
7	NRUT	I	SPR 11	6.23	6.73	9.03	9.89	9.57	9.30	8.58	7.15	5.98	5.71	5.67
8	NRUT	I	NO STRATEGIC RESERVE	6.23	6.25	8.29	8.74	8.06	8.78	8.44	7.29	5.73	4.98	3.93
9	NRUT	I	DIFFERENCE	0.01	0.38	0.74	0.95	0.75	0.52	0.09	-0.14	-0.30	-0.88	-1.68
10	NRUT	I	% DIFFERENCE	0.10	5.82	8.88	9.14	8.50	5.99	1.07	-1.96	-5.30	-15.34	-29.84
11			SAVINGS RATE (%)											
12	YPDSAVR	B	SPR 11	5.66	5.36	5.32	5.38	5.87	6.38	7.12	8.25	8.96	9.26	9.47
13	YPDSAVR	B	NO STRATEGIC RESERVE	5.67	5.71	5.72	5.66	5.73	6.21	6.82	7.88	8.63	9.06	9.18
14	YPDSAVR	B	DIFFERENCE	-0.01	-0.35	-0.40	-0.27	0.15	0.17	0.30	0.38	0.33	0.20	0.29
15	YPDSAVR	B	% DIFFERENCE	-0.15	-6.21	-6.99	-4.71	2.54	2.67	4.37	4.76	3.79	2.20	3.13
16														
17			SURPLUS OR DEFICIT, FEDERAL (CUR $)											
18	GVSURPFS	I	SPR 11	-20.8	-65.7	-36.7	-8.3	-5.1	6.2	26.9	43.7	18.9	19.8	18.8
19	GVSURPFS	I	NO STRATEGIC RESERVE	-20.8	-62.6	-47.8	-9.1	-2.8	2.4	19.8	7.0	3.3	1.3	11.4
20	GVSURPFS	I	DIFFERENCE	-0.0	-3.0	10.7	0.8	-2.3	3.9	12.7	14.8	13.7	12.7	-0.3
21	GVSURPFS	I	% DIFFERENCE	2.02	4.62	30.04	10.00	267.79	161.86	78.87	231.11	443.71	985.58	-2.88
22			SURPLUS OR DEF, STATE & LOC (CUR $)											
23	GVSURPSS	I	SPR 11	18.5	1.6	-8.2	-19.1	-25.9	-34.9	-40.8	-40.2	-32.1	-19.3	-8.0
24	GVSURPSS	I	NO STRATEGIC RESERVE	18.0	8.4	0.4	-7.7	-8.2	-16.3	-25.3	-24.3	-17.3	-10.3	-1.6
25	GVSURPSS	I	DIFFERENCE	-0.1	-6.9	-10.6	-11.4	-17.7	-18.5	-15.6	-15.8	-14.8	-9.1	-6.4
26	GVSURPSS	I	% DIFFERENCE	-0.54	-82.10	-126.07	147.96	215.84	113.62	63.32	65.64	87.78	89.14	400.21
27														
28			COMPEN, TO EMPLOYEES TO NAT, INCOME											
29	WSCS/YNS		SPR 11	76.5	77.9	76.7	77.2	78.0	78.6	78.8	79.0	79.2	79.8	80.2
30	WSCS/YNS		NO STRATEGIC RESERVE	76.5	77.7	76.6	77.4	77.8	78.3	78.5	78.5	78.4	78.5	78.6
31	WSCS/YNS		DIFFERENCE	-0.0	0.2	0.2	-0.1	0.3	0.3	0.3	0.5	0.8	1.3	1.7
32	WSCS/YNS		% DIFFERENCE	-0.01	0.32	0.20	-0.15	0.44	0.39	0.34	0.65	1.00	1.69	2.11
33			PROFITS TO NATIONAL INCOME											
34	CPUBTS/YNS		SPR 11	11.4	10.9	10.1	10.1	11.7	10.1	10.1	11.1	10.6	10.2	9.8
35	CPUBTS/YNS		NO STRATEGIC RESERVE	11.4	10.5	11.6	11.5	11.5	11.5	11.7	11.7	11.5	11.6	11.6
36	CPUBTS/YNS		DIFFERENCE	0.0	0.5	0.6	0.7	0.8	0.7	0.6	0.6	0.9	1.4	1.8
37	CPUBTS/YNS		% DIFFERENCE	0.00	4.31	5.76	6.79	5.88	5.66	3.66	4.89	7.52	10.00	13.07

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR11
NO SPR

TABLE 2.00 GROSS NATIONAL PRODUCT ($72)

LINE	VAR	LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1														
2			--------CONSTANT 72 DOLLARS--------											
3														
4			GROSS NATIONAL PRODUCT----------											
5	GNP		I SPR 11----------	1411.0	1387.1	1401.1	1476.0	1562.5	1646.0	1690.9	1767.1	1749.5	1888.8	1935.6
6	GNP		I NO STRATEGIC RESERVE----------	1412.2	1399.9	1408.6	1486.0	1582.1	1658.5	1691.7	1676.6	1752.6	1888.5	1935.4
7	GNP		I DIFFERENCE ----------	-0.6	-12.8	-19.5	-10.0	-19.6	-12.5	-0.8	-0.5	-3.0	0.3	0.2
8	GNP		I % DIFFERENCE ----------	-0.03	-0.92	-1.34	-0.71	-1.24	-0.84	-0.05	-0.21	-0.22	0.24	0.12
9			% CHANGE											
10	GNP		I SPR 11----------	0.0	-1.8	1.0	5.3	5.8	5.3	2.7	4.5	-1.0	7.9	2.5
11	GNP		I NO STRATEGIC RESERVE----------	0.0	-0.9	0.5	5.5	6.4	4.8	2.0	-0.9	4.6	7.7	2.5
12	GNP		I DIFFERENCE ----------	-0.0	-0.9	-0.5	0.2	0.6	-0.5	-0.7	-5.4	-5.6	-0.2	-0.0
13	GNP		I % DIFFERENCE ----------	-0.00	101.55	-10.22	35.26	-24.14	27.84	22.25	-1.83	-0.17	10.98	-0.03
14														
15			PERSONAL CONSUMPTION EXPENDITURES--											
16	CE		I SPR 11----------	911.0	895.9	917.0	938.7	998.1	970.2	1009.3	1057.5	1115.9	1184.8	1238.6
17	CE		I NO STRATEGIC RESERVE----------	911.0	904.7	928.1	947.3	998.0	987.2	1012.1	1056.5	1113.6	1184.7	1238.6
18	CE		I DIFFERENCE ----------	-0.2	-9.1	-10.6	-8.6	-11.9	-0.0	-2.7	1.0	0.3	14.1	18.5
19	CE		I % DIFFERENCE ----------	-0.02	-1.01	-1.16	-0.90	-1.23	-0.91	-0.27	0.10	0.29	1.20	1.49
20			% CHANGE											
21	CE		I SPR 11----------	1.2	-1.8	2.4	2.3	1.0	2.3	3.2	4.8	5.5	6.2	4.5
22	CE		I NO STRATEGIC RESERVE----------	1.2	-0.8	2.6	2.1	3.0	2.3	2.5	4.4	5.4	6.4	4.5
23	CE		I DIFFERENCE ----------	-0.0	-1.0	-0.1	-0.2	2.0	0.0	-0.2	-0.4	-0.1	0.2	-0.0
24	CE		I % DIFFERENCE ----------	-2.03	25.00	-5.01	11.95	-17.04	15.03	20.05	8.71	5.88	10.34	9.37
25														
26			DURABLE GOODS----------											
27	CED		I SPR 11----------	142.8	131.1	130.6	143.3	148.3	145.7	150.5	163.5	160.5	182.4	188.5
28	CED		I NO STRATEGIC RESERVE----------	142.9	135.3	143.2	148.5	147.4	149.6	151.5	163.2	170.6	190.5	210.1
29	CED		I DIFFERENCE ----------	-0.1	-4.2	-4.6	-5.2	0.9	-3.7	-0.9	0.3	-1.0	-7.7	-7.7
30	CED		I % DIFFERENCE ----------	-0.07	-3.11	-3.19	-3.49	0.59	-2.49	-0.62	0.19	-1.00	-3.73	-4.37
31			% CHANGE											
32	CED		I SPR 11----------	-2.7	-8.2	9.7	9.7	3.5	4.7	3.3	8.6	10.6	14.5	11.8
33	CED		I NO STRATEGIC RESERVE----------	-2.6	-5.3	5.8	3.7	-0.8	1.5	1.3	7.8	9.5	11.6	10.4
34	CED		I DIFFERENCE ----------	-0.1	-2.9	-3.1	1.1	-4.3	-3.0	-1.9	-0.8	-1.0	2.9	1.3
35	CED		I % DIFFERENCE ----------	2.76	54.29	-31.57	44.55	-219.76	78.66	140.04	11.29	9.30	32.69	9.58
36														
37			NONDURABLE GOODS----------											
38	CEN		I SPR 11----------	362.7	350.8	360.8	364.0	367.8	358.2	366.2	373.0	388.9	407.2	408.3
39	CEN		I NO STRATEGIC RESERVE----------	362.8	350.4	360.8	367.0	361.2	359.5	361.7	373.2	388.1	406.6	408.3
40	CEN		I DIFFERENCE ----------	-0.1	-0.4	-0.0	-3.0	6.6	-1.3	-0.5	-0.2	0.8	0.6	0.0
41	CEN		I % DIFFERENCE ----------	-0.02	-0.07	-0.00	-0.82	1.78	-0.01	-0.02	-0.04	0.20	0.15	0.00
42			% CHANGE											
43	CEN		I SPR 11----------	-0.2	-1.7	1.0	1.1	0.8	1.0	2.3	3.8	4.8	5.1	0.7
44	CEN		I NO STRATEGIC RESERVE----------	-0.1	-1.0	1.0	1.9	-1.1	1.0	1.3	3.8	4.8	5.8	0.5
45	CEN		I DIFFERENCE ----------	-0.1	-0.7	-0.0	-0.8	1.9	-0.0	1.0	-0.0	0.0	-0.7	0.2
46	CEN		I % DIFFERENCE ----------	12.17	75.15	-10.15	0.57	-20.88	10.48	30.04	12.16	0.58	12.43	0.58
47														
48			SERVICES----------											
49	CES		I SPR 11----------	426.1	427.6	439.3	451.8	466.6	480.3	498.6	520.9	544.5	575.6	608.7
50	CES		I NO STRATEGIC RESERVE----------	426.1	429.9	441.7	453.2	467.3	482.3	498.6	520.1	544.7	575.6	608.8
51	CES		I DIFFERENCE ----------	-0.1	-2.3	-2.7	-2.1	-2.8	-2.0	-0.3	0.9	1.8	0.0	0.0
52	CES		I % DIFFERENCE ----------	-0.01	-0.54	-0.60	-0.47	-0.59	-0.41	-0.05	0.17	0.32	0.00	0.00

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR11
NO SPR

TABLE 2.00 GROSS NATIONAL PRODUCT (672)

LINE	VAR	LABEL	ITEM	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1			% CHANGE											
2	CEQ		SPR 11	3.71	0.6	2.6	2.8	3.9	4.6	4.6	4.5	4.5	4.4	4.4
3	CEQ		NO STRATEGIC RESERVE	3.71	0.5	2.5	2.8	3.9	4.6	4.6	4.5	4.5	4.4	4.4
4	CEQ		DIFFERENCE	-0.01	0.1	0.1	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
5	CEQ		% DIFFERENCE	-0.17	14.56	-2.69	-4.75	-2.86	0.06	0.08	0.07	0.08	0.06	0.06
6			GROSS PRIVATE DOMESTIC INVESTMENT											
7	IGY		SPR 11	209.61	186.1	209.8	217.5	217.9	229.2	235.9	250.3	261.5	280.7	302.1
8	IGY		NO STRATEGIC RESERVE	209.61	190.7	215.6	219.6	220.0	229.4	237.5	252.7	264.5	282.5	304.1
9	IGY		DIFFERENCE	0.01	-4.6	-5.8	-2.1	-2.1	-0.2	-1.6	-2.5	-3.0	-1.8	-2.0
10	IGY		% DIFFERENCE	0.011	-2.42	-2.76	-0.87	-0.92	-0.07	-0.68	-0.96	-0.86	1.44	0.67
11			% CHANGE											
12	IGY		SPR 11	-3.21	-11.2	12.7	3.7	-0.2	5.2	2.9	6.1	4.5	7.3	7.6
13	IGY		NO STRATEGIC RESERVE	-3.21	-9.0	13.0	2.0	1.0	4.3	3.5	6.4	4.6	6.8	7.6
14	IGY		DIFFERENCE	0.01	-2.2	-0.3	1.6	-1.1	0.8	-0.6	-0.3	-0.1	0.4	-0.0
15	IGY		% DIFFERENCE	-0.33	24.67	-19.22	-156.20	140.19	52.25	-5.56	-7.26	-2.24	6.72	
16														
17			FIXED INVESTMENT											
18	IGF		SPR 11	199.01	186.9	203.0	211.1	207.3	210.5	219.7	230.6	237.6	256.2	275.8
19	IGF		NO STRATEGIC RESERVE	199.11	188.4	211.5	213.5	214.7	217.6	225.7	240.3	250.1	270.7	293.3
20	IGF		DIFFERENCE	-0.11	-1.5	-8.5	-2.4	-7.5	-7.0	-5.9	-9.6	-12.5	-14.5	-17.5
21	IGF		% DIFFERENCE	-0.03	-1.65	-3.99	-1.12	-3.36	-2.99	-1.78	-3.87	-5.26	-5.93	-6.00
22			% CHANGE											
23	IGF		SPR 11	-0.31	-7.3	9.8	3.8	-1.8	1.6	4.4	7.8	3.0	7.8	7.6
24	IGF		NO STRATEGIC RESERVE	-0.31	-5.3	12.2	1.0	-0.5	1.3	3.8	6.5	4.1	8.2	8.4
25	IGF		DIFFERENCE	-0.01	-2.0	-2.4	2.8	-1.3	0.3	0.6	1.3	-1.1	-0.4	-0.8
26	IGF		% DIFFERENCE	12.95	39.52	-20.01	312.48	-223.99	177.66	41.01	4.66	-10.00	-6.15	-9.00
27														
28			NONRESIDENTIAL											
29	IGFN		SPR 11	145.01	143.2	148.5	159.3	158.8	162.5	167.3	167.6	179.6	190.1	200.6
30	IGFN		NO STRATEGIC RESERVE	145.71	144.3	151.2	159.0	159.7	162.1	169.1	171.6	182.5	194.6	210.3
31	IGFN		DIFFERENCE	-0.01	-1.2	-2.7	0.3	-0.7	0.4	-1.11	-3.98	-2.99	-4.5	-9.7
32	IGFN		% DIFFERENCE	-0.62	-0.84	-1.79	0.19	-0.44	0.24	-1.11	-2.38	-1.64	-2.31	-4.78
33			% CHANGE											
34	IGFN		SPR 11	4.01	-1.7	3.7	7.3	0.5	1.6	3.0	0.1	7.1	5.8	5.6
35	IGFN		NO STRATEGIC RESERVE	4.01	-0.4	4.7	5.2	1.6	1.5	4.3	1.4	6.4	6.6	8.1
36	IGFN		DIFFERENCE	-0.01	-1.6	-1.0	2.1	-1.1	0.1	-1.3	-1.3	0.7	-0.8	-2.5
37	IGFN		% DIFFERENCE	-0.56	72.79	-21.05	53.14	-73.13	6.66	10.72	13.66	14.65	12.91	-0.00
38														
39			RESIDENTIAL STRUCTURES											
40	IGFR		SPR 11	54.01	51.7	56.5	61.0	57.2	58.0	62.1	65.2	77.6	83.1	85.0
41	IGFR		NO STRATEGIC RESERVE	54.01	50.8	59.0	61.0	58.0	58.0	63.1	66.2	78.7	84.1	88.3
42	IGFR		DIFFERENCE	-0.01	0.3	-2.7	0.1	-0.8	0.0	-0.7	-0.9	-1.0	-1.0	-3.3
43	IGFR		% DIFFERENCE	-0.07	0.58	-4.51	0.11	-1.35	0.04	-1.13	-1.36	-1.28	-1.20	-3.86
44			% CHANGE											
45	IGFR		SPR 11	-10.21	-22.6	10.0	13.0	7.0	1.0	7.0	12.0	11.1	7.1	2.3
46	IGFR		NO STRATEGIC RESERVE	-10.11	-18.5	16.0	9.0	3.7	0.0	9.1	12.0	12.0	7.0	5.0
47	IGFR		DIFFERENCE	-0.11	-4.2	-6.0	4.0	3.3	1.0	-2.0	0.0	-0.9	0.1	-2.7
48	IGFR		% DIFFERENCE	0.58	22.62	-10.93	45.56	-141.16	62.96	-20.19	0.00	-8.00	110.99	-43.79
49														
50			CHANGE IN BUSINESS INVENTORIES											
51	IBIY		SPR 11	10.01	1.2	9.8	9.3	9.8	13.7	15.2	15.9	20.2	20.5	21.0
52	IBIY		NO STRATEGIC RESERVE	9.91	2.3	7.9	9.0	10.1	13.6	15.0	16.0	21.0	20.7	21.0
53	IBIY		DIFFERENCE	0.01	-1.1	2.1	0.3	-0.3	0.1	0.2	-0.1	-0.8	-0.2	0.0
54	IBIY		% DIFFERENCE	0.74	-48.96	19.22	4.01	-2.58	0.61	1.27	0.61	-3.58	-0.76	0.00

WHARTON ANNUAL AND INDUSTRY FORECASTING MODEL
SPR11
NO SPR

TABLE 2,00 GROSS NATIONAL PRODUCT (572)

LINE	VAR	LABEL	I T E M	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1			STATE AND LOCAL											
2	GVPS	I	SPR 11	176.3	176.3	177.2	180.2	184.2	188.4	192.8	197.0	201.6	206.2	210.9
3	GVPS	I	NO STRATEGIC RESERVE	176.3	176.3	177.2	180.2	184.2	188.4	192.8	197.0	201.6	206.2	210.9
4	GVPS	I	DIFFERENCE	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	GVPS	I	% DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6			% CHANGE											
7	GVPS	I	SPR 11	-0.21	1.1	0.5	1.7	2.2	2.3	2.3	2.2	2.3	2.3	2.3
8	GVPS	I	NO STRATEGIC RESERVE	-0.21	1.1	0.5	1.7	2.2	2.3	2.3	2.2	2.3	2.3	2.3
9	GVPS	I	DIFFERENCE	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	GVPS	I	% DIFFERENCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Senator BRADLEY. Mr. Chairman, I don't know what the time is here. I have about another 20 or 30 questions. [Laughter.]

Senator PERCY. We will get you another cup of coffee. [Laughter.]

I think your time has expired. We will rotate on a 10-minute basis.

Looking back, Dr. Sawhill, it seems to me that lack of good advance planning and the lack of having top-level management priority assigned to the Iranian shortfall in 1979 had much to do with DOE's problems at that time. Two months ago, this subcommittee held hearings on a gasoline allocation program and DOE's main response to the shortage we had was the gasoline allocation program.

At that hearing, we had a really quite bleak picture painted of the net effect of DOE's effort. Some even implied that DOE's effort made the situation worse rather than alleviating gasoline lines. Several witnesses warned us that if another shortfall occurs before September 1981, last year's chaos could actually be repeated. I wonder if you agree with that assessment? What will DOE do differently to avoid this chaos if, say, we were to have a shortfall tomorrow from Iran and Iraq as a result of that war?

Mr. SAWHILL. There are a variety of things we can do to allocate supplies equitably. As I indicated in my testimony, I think reliance on the market mechanism, to the extent practical, is what we should do. A tax-and-rebate system would seem to me to be the kind of thing we should seriously consider.

Senator PERCY. What would be the effect on crude prices, and taking into account there has never been a real dropoff after an emergency situation?

Wouldn't the price get up to a whole new level?

Mr. SAWHILL. Well, there is no question, as we earlier discussed, that price would go up. I think some kind of a rebate—tax-and-rebate system—should be available to enable us to deal with those rising prices and cushion the impact on the economy.

Senator PERCY. We have been pictured as a pitiful giant sometimes. What would happen? If prices start escalating during a crisis of that kind, is there anything we could really do to restrain them?

Mr. SAWHILL. I don't think there is anything we could do to restrain prices. If we try to restrain prices, then we get gasoline lines. I think what you earlier indicated, that it is preferable to allocate supplies through the marketplace than allocate supplies by gasoline lines.

[At this point, Senator Sasser withdrew from the hearing room.]

Senator PERCY. It appears from this discussion that there is very little that we could do.

I would think that finding some way to restrain world crude prices during an emergency would be the A–No. 1, top priority at the Department of Energy. Yet I understand that very little is being done to address this problem. How much is being done to address this problem? What kind of conclusions do you come to?

Mr. SAWHILL. We have had a lot of discussion within the International Energy Agency, and we have agreed that in the event of a supply disruption that the energy ministers of IEA countries would come together and they would establish targets for reducing consumption. And by doing this, I think they would cushion the impact of a price increase. And further, we have proposed that the IEA seriously study some kind of coordinated stock management program so that

rather than everyone going out in the marketplace and scrambling for supplies that we coordinate our efforts and avoid the kind of sharp price increase that we experienced in the Iranian disruption.

I mean, the fact is that in the Iranian disruption, world crude production really didn't decline much, if at all. Prices rose very sharply. The reason they rose was that people scrambled into the marketplace and tried to build inventories. If we had avoided that scramble in the inventory buildup, we could have avoided the rapid price increase and avoided some of the adverse economic consequences of that price increase.

Senator PERCY. I would like to believe, along with you, that the International Energy Agency sharing agreement would help restrain oil prices by keeping member countries from bidding against each other, and so forth. But the minority staff of this subcommittee attended a recent IEA industry advisory board meeting in New York. They reported back to me that the IEA Secretariat acknowledges that existing international agreements might do little to restrain the price of crude.

I understand that IEA staff are very concerned about the situation. Are you and your staff aware of the sentiment within the IEA and the concerns that they have? Do you share those concerns?

Mr. SAWHILL. Yes. I am aware of their concerns. I am not talking about the International Energy Program as such. I am talking about the effort that, frankly, Secretary Duncan has led to get the oil ministers in the consuming nations to agree to establish targets for demand restraint. This is over and beyond the International Energy Program in the event of a supply disruption and also the effort that we have undertaken to try to get the International Energy Agency countries to focus on a coordinated stock management policy.

Senator PERCY. It is the particular responsibility of this committee to encourage and analyze the way the executive branch organizes itself to run the Government and to meet emergencies. If, as a result of the Iran-Iraq crisis, we have real problems, could you tell the subcommittee what Department of Energy Assistant Secretary would be responsible for implementing the emergency plans?

Mr. SAWHILL. The Secretary of Energy. The Secretary of Energy becomes the crisis manager in the event of a supply disruption and he coordinates the efforts which all members of the energy coordinating group would carry out.

Senator PERCY. I realize that ultimately the President is responsible for everything, but in this case let's be practical. An emergency situation requires on-the-job responses minute by minute, 24 hours a day, 7 days a week. The Secretary who has all kinds of other duties and responsibilities, just as you as Deputy Secretary really couldn't be expected to do it all.

Is there someone we can call and expect to be on top of almost every aspect of it—something like the State Department's crisis management operation on Iran? Is there one Assistant Secretary that would have that responsibility delegated to him or her?

Mr. SAWHILL. We have set up an office reporting directly to the Secretary, headed up by Bart House who is here with me, that has that responsibility. But the Secretary ultimately would have to make

the decisions to put in place the kinds of programs that Senator Bradley and I were earlier talking about.

Senator PERCY. Senator Javits could not be here today but he has asked me to ask this question of you, Dr. Sawhill. How many offices within the Department of Energy in addition to the new office headed by ERA Deputy Administrator Bart House are working on contingency planning activities? Whom does each report to and what does each do? You can supplement that for the record, perhaps by giving us a summary at this time and giving us some idea as to how many other offices are actually involved in crisis management.

Mr. SAWHILL. Almost every office within the Department, the International Affairs Office is dealing with the international aspects of the problem. We have our special adviser on the strategic reserve who is working with us on it. We have people in the Policy and Evaluation Office who are working on some of the longer range plans for dealing with a disruption. So there is a whole apparatus within the Department that is coordinated by Mr. House.

Senator PERCY. Is it true that also in the Economic Regulatory Administration there are certain functions that Scott Bush, Jerry Pepper, and Robert Davies also have in this area?

Mr. SAWHILL. Yes.

Senator PERCY. In the Office of Policy and Evaluation, does William Taylor have a role in this?

Mr. SAWHILL. Yes.

Senator PERCY. And does the Office of Oil have a responsibility to work on oil stockpiling alternatives?

Mr. SAWHILL. Yes.

Senator PERCY. And the Energy Information Administration; Al Linden?

Mr. SAWHILL. Yes.

Senator PERCY. The Office of Conservation and Solar Applications, in the Office of Management Services—in all I count 11 such offices.

Mr. SAWHILL. I think there are probably more than that.

Senator PERCY. That do not report to Bart House.

Mr. SAWHILL. They have other functions.

Senator PERCY. Who pulls it all together?

Mr. SAWHILL. He does.

Senator PERCY. They don't report to him but he has to pull them together?

Mr. SAWHILL. He coordinates their activities and I think that is the appropriate way to handle it. I would argue very strongly that these offices have many other functions. One of them you described has the responsibility for our coal conversion program. Obviously, in the event of a supply disruption we would want to accelerate coal conversion so that we would then utilize that office and coordinate their efforts to accelerate the coal conversion program.

But on an ongoing, everyday basis, they have other important responsibilities. I think that is the way it should be. We wouldn't want the Assistant Secretary for International Affairs reporting to Bart House, because that person has a whole variety of other responsibilities for dealing with the Algerian gas negotiations, for dealing with our relationships with Canada, with the OPEC countries. So obviously

we don't want them all reporting to Bart House but we want to firmly establish that Mr. House, reporting to the Secretary, takes over in an emergency and coordinates their efforts and activities.

Senator PERCY. If I could just confidentially talk to you for a moment as a longtime old friend, who has made a tremendous impact there, has made a great record, and is fully deserving of this immense responsibility being placed in you, I think the powerful office you are about to head can have an immense impact on this country.

You are going to have, I think, a tremendous amount of things to accomplish and do here. I think we have given you, and I hope the Congress has given you, the tools to do it, and I hope you will be confirmed very rapidly. But as a last backward glance, could you take a look for your old friend at whether or not it wouldn't be a little better to have one Assistant Secretary who could pull everything together, to whom you can say the buck stops here? And have that person really responsible?

If you have any comment now, I would appreciate it, but if you want to reflect on it a little bit, then just let me know how we can better organize this to pull all the strings together so we know who is responsible?

Mr. SAWHILL. Let me discuss with you some of the organizational options that we have looked at and I would enjoy having a discussion with you on that question of organization. Perhaps it could be helpful.

Senator PERCY. In civil service reform, we have created the senior executive service, and we just had a petition from a number of agencies not in that system now who want to get in it and award its performance bonuses, but I don't know of any better place we could have that level of person than in this kind of activity. How many SES employees do you now have working primarily on emergency preparedness, and what percentage of DOE's total SES work forces do they actually constitute?

Mr. SAWHILL. As you described, there are 11 offices at least within the Department that are working on this problem. So I am sure there are many SES employees. I couldn't give you the exact number because employees in all of these offices that you have outlined are actively working and spending part of their time on this issue.

Senator PERCY. As my last question in this round, let me ask what role does the National Security Council have in planning for a supply disruption? Are they involved?

Mr. SAWHILL. Yes. They serve as a member of the Energy Coordinating Committee and they would work with us on establishing the defense requirements and coordinating our efforts with the Defense Department.

Senator PERCY. What role would the National Security Council have in key decisions that would have to be made in the midst of any crisis or in the midst of any real shortage?

Mr. SAWHILL. As a member of the Energy Coordinating Committee, they would have a very prominent role.

Senator PERCY. Thank you. Senator Bradley?

Senator BRADLEY. Thank you, Mr. Chairman.

Again, I would like to express my appreciation to you for allowing me to join the committee today for this hearing.

Senator PERCY. I am not allowing you to. I called you up and drafted you. [Laughter.]

You are one of the best experts in the Senate of the United States on this issue.

Senator BRADLEY. I was trying to be discreet, Mr. Chairman. [Laughter.]

Could I ask the Department what is the present level of the strategic petroleum reserve?

Mr. SAWHILL. 91 million barrels.

Senator BRADLEY. 91 million barrels?

Mr. SAWHILL. Yes.

Senator BRADLEY. I am very pleased that today the oil begins to trickle back into the reserve. Could you tell me when was the last time oil flowed into the reserve?

Mr. SAWHILL. Abe?

Mr. CHAYES. I think the summer of 1978; spring of 1978. Excuse me. Flowing in, actual physical fill was the spring of 1979, but the contracting ended in the summer of 1978.

Senator BRADLEY. Summer of 1978 was the last purchase agreement?

Mr. CHAYES. I think so.

Senator BRADLEY. Could you tell me how many days given our present imports 91 million barrels would cushion this country in the event of a supply disruption.

Mr. CHAYES. If we lost 6½ million barrels a day of imports, that is a simple matter of division; 6 into 90 is roughly 15. On the other hand, if you think of some of the measures that the Secretary spoke about, if you think of the current levels of our industrial stocks, and so on, I don't think we would be drawing down the reserve at the rate of 6 million barrels a day. I think it would be a lot less.

Senator BRADLEY. So to give you the benefit of the doubt, instead of 15 days, we have 30 days.

Mr. CHAYES. All right.

Senator BRADLEY. So the last time oil was purchased for the reserve was the summer of 1978; 91 million barrels which is roughly 20 to 30 days of present import levels. Could you tell me what was the maximum fill rate in filling that 91 million barrels? How many barrels per day?

Mr. CHAYES. I am sorry. I don't have that information.

Senator BRADLEY. Does anyone?

Mr. SAWHILL. We will supply that, Senator Bradley.

Senator BRADLEY. Was it more than 100,000 barrels a day?

Mr. CHAYES. I think it was.

Senator BRADLEY. Was it closer to 300,000 barrels a day?

Mr. CHAYES. Yes. The largest fill rate was 330,000 barrels a day. I think it may well be.

Senator BRADLEY. So the decision in the summer of 1978 was to discontinue purchases for the oil reserve. Why was that decision taken?

Mr. CHAYES. It is perhaps an exaggeration, to call it a decision. We had solicitations out and nobody was answering our solicitations. So we didn't really have any contracts to conclude. Then, of course, when the Iranian shortfall began, which was about 4 or 5 months later,

there was a feeling that we should no longer try to purchase in the then-existing market condition.

Senator BRADLEY. So the answer is the reason it was discontinued is you couldn't get the oil.

Mr. CHAYES. We couldn't get the oil, that is right.

Senator BRADLEY. And you were afraid that the purchase of oil might exert an upward pressure on price; is that correct?

Mr. CHAYES. Well, we didn't get any offers at all. I mean we did not solicit it at a particular price. We asked for offers to sell. People were entitled to name what price they were willing to sell at. We didn't get any offers.

Senator BRADLEY. What is the present level of surplus in world production?

Mr. CHAYES. Well, you get a lot of estimates. I think the general notion is that there is 1 million to 2 million barrels a day that are in excess of current demand.

[At this point, Senators Percy and Sasser withdrew from the hearing room.]

Senator BRADLEY. So, 2 million barrels surplus.

Mr. CHAYES. I think it is worth talking about what happens to that surplus. Essentially it goes into stocks here and among our allies. It doesn't get consumed.

Senator BRADLEY. I will get to that, Mr. Chayes. So we have a 2-million-barrel-a-day surplus. The reason we discontinued filling the reserve is we couldn't get the oil. That is obviously not a problem now. Why then didn't we fill the reserve?

[At this point, Senator Percy entered the hearing room.]

Mr. CHAYES. Well, Senator, I am very glad you are here at this session because although you wouldn't think we have done enough, I do think it is appropriate that you should be here and hear the answer that we are filling as of today. I think this is a different fill than is represented by the transmission from Elk Hills to Louisiana. We have a VLCC today unloading.

Senator BRADLEY. Mr. Chayes, you are filling at 100,000 barrels a day. I applaud that. That is in concurrence with the law that was passed by the Congress.

Mr. CHAYES. Well, I am just trying to say what we are actually doing. We have right now in hand about 4 million barrels which I think will come in, in the next month or so. I think right now we can look forward to a successful completion of the NPR–SPR exchange which in total amounts to about 36 million barrels for the year. As the Secretary said in his letter to you, we look forward to a rate of fill over the fiscal year substantially in excess of the 100,000 barrels. So we have the 100,000 barrels in place, so to speak, under control, and we are now turning to that second phase of trying to increase the level over the 100,000-barrel average.

Senator BRADLEY. How long has world production been in a surplus of 1 million to 2 million barrels a day?

Mr. CHAYES. Well, you could say—I don't know exactly how long it has been——

Senator BRADLEY. Six months, a year?

Mr. CHAYES [continuing]. At 2 million a day. But one could say we have had something that people have called a glut, or a temporary

glut since sometime this summer. Now it was obviously loosening up before that.

Senator BRADLEY. Why didn't we fill the reserve when there was the first appearance of a glut?

Mr. CHAYES. Well, Senator, I think we did make our decision to go forward in June. And you helped us. But it has taken a certain amount of time to get the administrative machinery in motion. As I said when the Congress came back in August, we expected to have these contracts concluded by the first of October. We, in fact, beat that deadline a little bit. So I am rather pleased with the progress that has been made.

I think the orientation of our policy——

Senator BRADLEY. I think I would encourage you to be candid with the committee, Mr. Chayes, in discussing if there are any other reasons, besides the difficulty of obtaining oil, as to why you didn't begin filling the reserve sooner.

Mr. CHAYES. Well, I think one has to say that all of these decisions are made with regard to market conditions and their potential impact on market conditions. For my part, I think I was interested in getting in place a steady and reliable strategy for filling the reserve, one that wouldn't go up and down depending on whether there is a glut or not, but would continue in a reliable and steady manner. And that seemed to me to be the first priority and that really is the path we have taken.

Senator BRADLEY. I haven't heard the word Saudi Arabia in this discussion at all. I mean, do you want to address that issue? Is it a possibility that the wishes of the Saudis might have affected our decision to fill the reserve?

Mr. CHAYES. Well, I don't think it is fair or right to talk about the wishes of the Saudis. We have to take into account attitudes and potential reactions of a range of other countries. The oil business is an international business. Dr. Sawhill was explaining, for example, the importance of cooperation with our allies in all sorts of these stock management, stock acquisition programs.

Senator BRADLEY. Was Saudi objection to the filling of the SPR one of the reasons we didn't fill the strategic reserve sooner?

Mr. CHAYES. Well, I would not say that, no.

Senator BRADLEY. You would not say that?

Mr. CHAYES. No. I would say that we gave consideration to those possibilities, but there were a number of other considerations that led to our decison.

Senator BRADLEY. I find that less than candid and I would prefer to move on rather than beat this horse.

Would SPR oil be subject to IEA agreements?

Mr. CHAYES. I think the IEA agreements do not extend to government stocks. Is that right, Peter?

Mr. BORRE. That is correct. Under the IEA agreements, we would have a demand restraint obligation. We would have flexibility as to how under a formal allocation system we would meet that demand restraint. It is between holding back consumption or drawing down inventories, be they commercial or storage. So I would say that we have maximum discretion and we could, in fact, take measures that would not involve the use of the SPR if that is what we decided for a particular contingency.

Senator BRADLEY. Mr. Borre, you have been activ[illegible]n the IEA on behalf of this Government. I was curious if you could share with the committee what portion of the IEA's resources are devoted to disruption contingency planning as opposed to simply import reduction.

Mr. BORRE. Under the structure of the IEA, there are four standing groups, one of which deals with emergency questions. There are three others that have other issues that bear on the question of emergency. For example, the standing group in the oil markets that monitors conditions, the standing group in long-term cooperation that looks at day in, day out policy, short-term and long-term. I would not conclude that 25 percent of the time of the IEA Secretariat, or individuals, myself and many others included, is an upper limit on the amount of time or presumably the concern about emergency conditions.

Senator BRADLEY. What is your best guess as to the amount of time? Is it 25 percent? Is it 10?

Mr. BORRE. To be specific and thinking of 1979, for example, which was quite a lesson for all of us, if one looks at the amount of time spent at the senior level, the governing board of the International Energy Agency, both at the Cabinet level and at senior official level, I would say that the amount of time spent on dealing with Iranian disruption and oil market instability was well above 25 percent. We have to go back and look at agendas, but as a benchmark I would guess that easily 40 to 50 percent of the time of that organization, permanent staff, officials in attendance, was spent on the Iranian disruption in the course of that year.

I might add that I wish we had maintained that ratio in the previous years, 1977 and 1978. I do not mean to say that over the course of many years we have achieved that level of concern.

Senator BRADLEY. Could you tell me if the disruption group, and I think Dr. Sawhill referred to the coordination, it covers only stock acquisition, or are there also drawdown strategies being actively pursued by that disruption group?

Mr. BORRE. Senator, not unlike the Department of Energy, you will find that responsibilities are not totally focused on this question on the IEA side of this. For example, the standing group on emergency questions that looks at——

Senator BRADLEY. You said it was in excess of 25 percent of all of the IEA's time is spent on this now.

Mr. BORRE. But it is spread across several of the standing groups. There is not a focal point that has virtual monopoly on the emergency question issue.

Does that respond to your question?

Senator BRADLEY. It is a little unclear. You say there is a disruption group that is established to handle emergencies, disruptions; 25 percent of all the IEA's time is spent on this disruption issue. Is that correct? That is what I understood you to say. The question is, if 25 percent of the IEA's time is spent on the disruption issue, are they dealing with oil acquisition or are they also dealing with drawdown strategies?

Mr. BORRE. Let me try the second point. On the question of acquisition of stocks or drawdown strategies, you will find several bodies in the IEA that concern themselves with this issue. The emergency group,

for example, will deal with a narrow question of reporting, conversion from metric units to volume units, and the like. But I think the point you may be searching for is that the effort to get a coordinated IEA strategy of inventory management, particularly during a tight market, is something that is being discussed now at the Governing Board level and I would expect it would be taken up at the ministerial meeting of the Governing Board scheduled for December. Other bodies also address the issue, but we do not have an agreed upon framework such that the mechanical bodies, the standing group bodies, can do the implementational work.

Senator BRADLEY. Are we doing anything in the IEA to try to focus their attention on the need to move in this area or do you think that more action is necessary?

Mr. BORRE. The answer to both questions briefly is yes. Secretary Sawhill mentioned earlier the work that Secretary Duncan has been doing in the course of the IEA ministerials—two he has already attended, in December of 1979 and in May of 1980—to get a better framework for short-term response measures, first of all, and second to put in the agenda for senior-level discussion this very difficult question of inventory management during a tight market.

Senator BRADLEY. That includes drawdown, not just acquisition?

Mr. BORRE. That is entirely correct, Senator.

Senator BRADLEY. Who is the designated official at DOE that handles this attempt to persuade the IEA to move more to emergency preparedness?

Mr. BORRE. There are two arenas where that issue gets discussed. At the Governing Board itself, the DOE designates the Assistant Secretary for International Affairs, Les Goldman, and the State Department designates the Assistant Secretary of State for Economic and Business Affairs, Deane Hinton. At the standing group a more technical member of IEA staff, David Oliver, carries the ball on discussions of coordinated stock management policies.

Senator BRADLEY. Thank you, Mr. Chairman. I have two notes.

Senator PERCY. We will come back to you.

Just to follow up on some of Senator Bradley's earlier inquiry, I think it is quite right to develop a policy that can stay there. As I understand your response to his questions the policy to build up our strategic reserve is that we will fill it steadily and consistently at the rate of about 100,000 barrels a day and is that the long-term plan?

Mr. CHAYES. The policy as stated in Secretary Duncan's letter to Senator Hollings, a copy of which was sent to Senator Bradley, is that we regard the 100,000 barrels a day as minimum, not an optimal rate. We intend substantially to exceed that rate in fiscal year 1981. To answer the first part of your question, my feeling and I think it has been supported throughout the administration, is the way to start is to get this 100,000-barrel-a-day base at least on the naval petroleum reserve in place because that is going to be a steady, reliable source and not so much subject to market and other vagaries.

Senator PERCY. Would the 250 million barrel reserve, if filled to capacity, give us about a 40-day supply at present import rates?

Mr. CHAYES. I think the questions are do you measure total imports, are you planning for a total cutoff, and are you assuming that there will be no potential demand constraint. I think none of those assump-

tions is correct, and therefore the actual cushion that the strategic petroleum reserve gives you is something like twice the amount of the daily level of imports. So that if we had 250 million barrels, I think it would look more like 80 days instead of 40 days.

Senator PERCY. Again, to put it in perspective, pursuant to Senator Bradley's question, building up the 40-day supply at the minimum level average, 100,000 a day would take something under 5 years to accomplish. At the end of the 5 years, all we could have is a 40-day supply. It is better than what we have now, but it is not a panacea by any means.

Of the 150,000 barrels per day being produced in the naval petroleum reserve, about 100,000 of that is going into this. If you only put in the minimum, where would this other 50,000 barrels a day go?

Mr. CHAYES. There is a Chevron Co., which has ownership rights for, I think, about 30,000 or so barrels a day and the other remaining oil is set aside for small refiners on the west coast to provide them with a feed stock for their refineries.

Senator PERCY. Why is that in the public interest? This is public oil and should be used for a public purpose.

Mr. CHAYES. Yes. It is important, however, that those refineries remain in business. It is very difficult for them to get other oil.

Senator PERCY. Why is that important for anyone other than the company?

Mr. CHAYES. They supply product to the west coast which is quite important. They supply product to our defense installations on the west coast.

Senator PERCY. How much of this is converted into gasoline?

Mr. CHAYES. For general consumption? I am sorry. I don't know, Senator.

Senator PERCY. Could we have that figure?

Mr. CHAYES. This information is not available. But in any event, there are several provisions for the protection of small refiners who have less access to oil supplies than the big companies but whose production in total really amounts to a considerable share of our supply, and this is one of them. Such a set-aside is provided for specifically, not mandated but authorized in the legislation on the naval petroleum reserve.

Senator PERCY. Mr. Chayes, I want you to know we are delighted to have you in this job, and you have bipartisan support for filling your primary mission. Even when your job is finished, we can't look upon it as the kind of insurance policy we would like to have, but it is better than what we now have. We certainly hope that you will drive forward just as rapidly as possible to do what is necessary. Under emergency circumstances we would need to take a maximum advantage out of every barrel of crude we can get our hands on. Do you think it really makes sense to reallocate to small refiners who produce little home heating fuel out of each barrel of crude?

Mr. CHAYES. I think for the moment it continues to make sense. The picture will change, I think, when deregulaton is complete in the fall of 1981. One of the objectives of that phased deregulation was to permit people to adjust to those problems. So I would not now advocate the end of that allocation. On the other hand, we have that policy under examination continuously and you are quite right to say that there is

an extra 50,000 barrels a day there in the NPR that might be worthwhile to see what we can get.

Senator PERCY. Dr. Sawhill, I would like to focus on what might be a small part, but a critical part, of the way DOE manages its emergency plans.

We can think back to last year. DOE and the country were caught short by the Iranian shortfall, and all the gas lines that resulted in that were evidence that we did not have adequate preparation for that. We want to try to prevent that in the future.

As you put your allocation programs into place on an emergency basis, a good deal of confusion seemed to have been generated in the marketplace, as our hearing last July clearly indicated. This put extraordinary pressure on DOE's Office of Hearings and Appeals which had to cope with individual requests for relief from the arbitrary applications of the allocation rules.

Of course, that is always the problem when you get into regulation, just as it would be a nightmare under gasoline rationing. The whole fuel supply chain would be put to a severe test. At least half of the country would feel they deserve more gasoline than the rationing plan would provide.

Last year, OHA quickly became something of a mop and bucket brigade cleaning up after the regulatory mess left by DOE's emergency application of the gasoline allocation program. For example, it appeared to us during the course of those hearings that on many occasions DOE used OHA's exceptions process as a shortcut to establish new regulatory policies, in the agrifuels gasohol case, the District of Columbia emergency gasoline relocation case, the Alaskan North Slope crude pricing case. Do you think this was appropriate, and why was this allowed to occur?

Mr. SAWHILL. I think it is appropriate to have a safety valve, to have exceptions and appeals process in the agency, and Congress has in fact mandated that that would be the case. We have tried to streamline the OHA operation and have made some progress in that regard. In the event of another emergency, we think an emergency valve would be appropriate and we would make every effort.

Senator PERCY. You actually had to overrule on the Alaskan North Slope case?

Mr. SAWHILL. Yes. I did.

Senator PERCY. We had a lot of testimony describing OHA's extraordinary mushrooming of its caseload. At one time, 1 in every 15 gas station owners in the United States had a case pending at OHA. Some had to wait as long as a year to get their cases decided. In January, Secretary Duncan instructed OHA to eliminate its case backload. It is now September and the OHA backload is still about 5,000 cases. Many of these cases were initially submitted in 1979. I understand, obviously, that a zero backlog would be impossible.

This is a large backlog. Could you give us some indication as to why more progress has not been made?

Mr. SAWHILL. There are restrictions on the number of people that we can hire as an agency and that we allocate to the OHA. I have been impressed with the competency of their staff. They are working hard to reduce that backlog and I think we have made some progress in that regard. I would be glad to outline that for you for the record.

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[Additional information furnished follows:]

The inventory of requests for administrative and other types of relief before the Office of Hearings and Appeals has been reduced very substantially during the past twelve months. At the end of September 1979 the Office's open inventory stood at 9,849 cases while at the end of September 1980 that number had been reduced to 4,477 requests. Including new submissions, this inventory reduction has been achieved by resolving approximately 28,000 applications.

Senator PERCY. This subcommittee's review of the gasoline allocation program led to a review of the Office of Hearings and Appeals program, primarily its exceptions process. Mel Goldstein, who has been OHA Director for years, has just resigned, and I understand that you are now looking for a successor. Do you have any plans to alter the role of OHA or its Director as soon as the new one takes over?

Mr. SAWHILL. We have appointed a new Director or at least on an acting basis, who has been a deputy to Mr. Goldstein. His name is George Breznay. I don't think we have any immediate plans to change the mission of that office.

Senator PERCY. I did raise at the time with Mel Goldstein who I think for the most part did a very commendable job——

Mr. SAWHILL. I do, too.

Senator PERCY [continuing]. Under extraordinarily difficult circumstances whether or not a job that has as much power as it does, almost economic life and death for some businesses, should not be subject to Senate confirmation. What is your judgment on that?

Mr. SAWHILL. I think, obviously, that is a matter for you to decide. I will say this, that before appointing Mr. Goldstein's successor, I did advise the appropriate committees, committee chairmen of our intended action and they indicated that they felt Mr. Breznay was well qualified to move into this position.

Senator PERCY. You are well aware of the frustration that we have had, and you thoughtfully commented to me just before the hearing started on this matter. I would like to put as a matter of public record your comment on that. We did receive valuable testimony from Mel Goldstein during our allocation hearings in July and I did ask several followup questions of Mr. Goldstein at that time. As of today, I have not received a response and I was discouraged because this might be some further indication of what may be the main OHA problem, a lack of good management, both within OHA and the Secretarial level.

Could you explain why we have not received replies to those questions yet, 7 weeks later, and when we can expect them?

Mr. SAWHILL. I had not been aware before this hearing that the replies had been requested and were still outstanding. I became aware of it. I have spoken to the Office of Hearings and Appeals and they have advised me that within the next week or two they will have that material to you.

Senator PERCY. This is my last question in this round. In the event of a very severe crude oil shortage, is it possible that DOE might have to allocate home heating oil, aviation fuel, and other petroleum products besides gasoline? How would DOE accomplish this if it should be necessary? After all, we can't stand in line to buy heating oil. You have to figure out some other way to allocate it. Half of the people in this country might be applying to your Office of Hearings

and Appeals, just as such a large number of retail operators, gasoline stations, went through the process last summer. How could we possibly handle that kind of a situation?

Mr. SAWHILL. I think the allocation programs are extremely difficult to operate, and therefore I would feel that we should not develop such programs except in the most severe of emergencies.

Senator PERCY. What would you consider a severe enough emergency to warrant the use of an allocation program?

Mr. SAWHILL. I don't know that I could anticipate that in advance.

Senator PERCY. I agree with you. This is a power of last resort, and we have seen their great difficulties which are terribly frustrating at the time to everyone.

Senator Bradley?

Senator BRADLEY. Thank you, Mr. Chairman.

Did the Justice Department consult you before declaring that we no longer face an international energy emergency and therefore don't need to continue providing limited antitrust defenses for the U.S. oil companies?

Mr. SAWHILL. They pointed out to us, Senator Bradley, that their interpretation of the law was that they had to make that finding; yes.

Senator BRADLEY. They made the finding that there wasn't an international oil emergency without assessing whether there was an international oil emergency? They made it on the basis of legal grounds only?

Mr. SAWHILL. They did make it on the basis of legal grounds. It seems to me that is what they are really equipped to do.

Senator BRADLEY. Have you heard any other IEA members or top officials of other oil-consuming nations complain about our U.S. antitrust laws impeding emergency preparedness?

Mr. SAWHILL. I will put it this way: I think that we should take a careful look at that statute. I would like to be in a position where we could permit our companies to supply that data to the IEA. The Justice Department indicated under the present environment we are not in that situation and I would hope that we might amend the statute so that we could be in that situation.

However, I would also tell you that we are endeavoring now to collect the data ourselves and supply it on a consolidated basis with the IEA.

Senator BRADLEY. I saw Mr. Borre raise his hand. By the way, I congratulate on your management award. Do you want to add something? Did you want to add something?

Mr. SAWHILL. It was a well-deserved award, I should say. I appreciate your making that remark.

Mr. BORRE. I am doing fine so far. I will let the rest. Thank you, Senator.

Senator BRADLEY. Would you tell me, please, the IEA now has a sharing agreement in place. If there is a 7-percent disruption of any member country's oil imports, then the other IEA members will share their supplies. Is it your judgment that all members are firmly committed to this course of action?

Mr. SAWHILL. Can I ask Mr. Borre to respond?

Mr. BORRE. Senator, in an open hearing where you have 21 countries that have agreed to a binding international obligation, the colleagues from other departments around or conferences, if you prefer, one has to answer yes. They have given their international good work and if the triggering conditions are met, they will in fact comply.

I would say this: That the numbers have a hard and fast quality to them. For example, the 7-percent threshold that you mentioned. My colleague, Mr. Linden, probably knows much better than I do, at least, how difficult it is to get a fix on a specific number. Therefore, it is entirely possible that under a hypothetical situation where one goes into, say, a disruption of magnitude X, the response can be, well, our numbers really show that the disruption is of magnitude Y.

Senator BRADLEY. So the answer to your question is there is this piece of paper that everybody signed that says when there is a 7-percent disruption we will have a sharing agreement, but there is probably great dispute as to what constitutes 7 percent. Is that what you are saying?

Mr. BORRE. There is, first of all, a verification cycle that one does have to go through.

Senator BRADLEY. How long does that take?

Mr. BORRE. Under emergency procedures, you can convene the proper officials within 48 hours of notification.

Senator BRADLEY. How long does it take after the officials are convened?

Mr. BORRE. It depends on how the discussions unfold. They can reach agreement within 1 hour or they can talk and adjourn and talk and adjourn for a period of time.

Senator BRADLEY. I guess the real question is: How do we know this is going to work? How do we know that people are committed to it, that the systems work, that indeed we all have an agreement on what constitutes 7 percent, because there is one measuring stick? How do we know this is going to work? Yet, this is always the one piece of information that is dredged up to prove that we have an emergency preparedness strategy, namely that we will share if there is a disruption.

Mr. BORRE. Senator, first of all, I am sure you are aware of the fact that we are about to enter on October 1 the third cycle of testing of the allocation system. I would hope, and frankly, expect that something has been learned not just from the last two simulations, but from the action of or perhaps lack of adequate action during the disruption in 1979.

Senator BRADLEY. As someone who has participated in such staff exercises, I'd like to know whether anyone talks about the difference between how the staff exercise will work and the incredible problems that would be involved in actually putting it into place?

Mr. BORRE. Frequently. I would say this, though: That having a third series of tests over an extended period of time in focusing frankly on the national response, the so-called national emergency supply organizations, Bart House and his 21 counterparts, we would expect, frankly, to sensitize the key officials in the other member countries of the capabilities, problems and the need to take this seriously in an operational way. That is the real payoff in an exercise.

Senator BRADLEY. If there were an interruption and its size was either disputed or was less than 7 percent as Iran was in 1979, what

specific things has the IEA done to prevent another Iranian-style price runup?

Mr. BORRE. If I could use a little bit of jargon, you are speaking to a so-called subthreshold situation, or where the disruption doesn't meet the so-called 7-percent test. That was the great gap, frankly, in 1979, and a series of national measures debated and agreed upon in Paris was taken. But Secretary Duncan has been pursuing at the last two ministerials the system of national ceilings that would be used during an emergency where you don't have enough to trigger the formal allocation system, but where each country pursued its usual consumption and inventory practices, you would create more price pressure as the kind outlined in the chart.

There is a gap in the IEA armory, if you like, with this sub-7-percent condition, and it has been the task of our diplomacy in these ministerial-level meetings to get the other 20 countries to agree to collective actions in this country. They include, of course, not just agreeing to a particular ceiling, which when added up among the IEA countries——

Senator BRADLEY. Supply ceilings?

Mr. BORRE. Import ceilings. It is not only the matter of agreeing to realistic ceilings that add up to something that gives us the prospect of market balance, but supplementing that with the measures that you are speaking of earlier, namely restraint as far as stockpiling those and perhaps stock drawdown policies.

Senator BRADLEY. You know, last week there was a review committee from the IEA that came through town and they were here to discuss long-term strategy. They were here 4 days and they met with the Congress for 2 hours—1 hour at the Senate and 1 hour at the House of Representatives. Now, first of all, whoever planned their schedule I think should be fired, or, if not fired, severely reprimanded, because while I may have a great respect for the Department of Energy, I think that the Congress has out of 4 days a little more to say on energy policy than 2 hours, particularly on long-term strategy. However, I am not raising this issue to make that point, but simply to ask whether there is such a review team that travels around the world talking to various governments about emergency preparedness?

Mr. BORRE. The review team, I don't want to add fuel to the fire, did meet with Deputy Secretary Sawhill this morning. After they asked a range of questions, Dr. Sawhill said that something had been omitted, that is the question of emergency preparedness. There is another team that does travel around the world and hit the 21 member countries and speak to the emergency preparedness issue. I can tell you personally they will have as much time as is available from the committees on the Hill when they come to Washington.

Senator BRADLEY. When are they coming to Washington?

Mr. BORRE. After the simulation test is run. Right now all of the emergency preparedness people are involved in that. I would say early in the new year, Mr. Chairman.

Senator BRADLEY. Let me ask one more question.

Senator PERCY. Please finish up.

Senator BRADLEY. On page 16 of Dr. Sawhill's statement he talks about a disruption tariff to limit the transfer of national wealth to foreign producers during a disruption. He says such a restraint meas-

ure, if also imposed by our allies, might reduce increases in world oil prices.

The concept of a disruption tariff is that when there is a disruption of 5, 10 million barrels a day, we know one thing, the price is going to go up. The question is, who gets the benefit of the price increase, the consuming nation or the producing nation? In your statement you have talked about coordination with allies. Can you tell me the extent to which we have discussed, and the priority placed on coordination on disruption tariff policy? For example, has it ever been raised at a summit meeting?

Mr. SAWHILL. Not as far as I know.

Senator BRADLEY. Is there any reason that we know of why it hasn't been raised at a summit meeting, if this is indeed——

Mr. SAWHILL. I will put it this way: It seems to me this would be a very effective mechanism. It would be, as you have indicated about some other things, a politically difficult thing to impose and would have to be—there would have to be a commitment, a very strong commitment, on the part of all countries to do it. I think it is something that we should propose to the IEA, and I think it is something that should be discussed by energy ministers. But as far as I know, it has not been.

Senator BRADLEY. It has not been discussed.

Mr. SAWHILL. As far as I know, it has not been on the agenda of an IEA——

Senator BRADLEY. Ministerial meeting.

Mr. SAWHILL [continuing]. Ministerial meeting.

Senator BRADLEY. Have you in the off hours of an IEA meeting, Mr. Borre, ever discussed this with a colleague with whom you ponder the possibility that Iraq and Iran might blow up tomorrow, you lose 10 million barrels of oil a day, and you don't want your country to go broke? Have you ever thought about that?

Mr. BORRE. Senator, we have not had a coordinated Washington position which, as you know, is sometimes as difficult to secure as a coordinated Paris position. But we have not had a coordinated official Washington position that we could take over. Now at the risk of inviting reprisals from my colleagues at OMB, yes, certain persons unnamed in the corridors of Paris have talked at the end of these long sessions where we fuse about adverbs and technical questions, what would one really do if another major disruption came up? The academic community has looked at the issue of fiscal measures and rebates. I must say candidly that I have not noted in any of the other 20 IEA countries a great deal of enthusiasm, advance thinking and readiness to put this on the table as an official proposal.

I would add one other comment on the summits. I was reviewing very quickly in the 1978 summit in Bonn, that became a price discussion, something of a bilateral discussion between the host government and ourselves. The 1979 Tokyo summit came in the depth of the Iranian market downturn and a lot was taken out of that summit, namely, the system of import ceilings that we have tried to build on.

In 1980 in Venice, it is my judgment, and I think shared, that a lot of respectable work was done on long-term supply and conservation measures. There is just so much that can be jammed into one particular

day-and-a-half or two-day summit meeting that has to range across the entire economic landscape.

Senator BRADLEY. If we did have that 5- to 10-million-barrel-a-day disruption, and we didn't have a disruption tariff in place, we know one thing, and that is the world price of oil would skyrocket. Some countries have more money than other countries. Would the world's financial system in your judgment, Dr. Sawhill, be able to finance an increase in price that would result from a 10-million-barrel-a-day disruption?

Mr. SAWHILL. I don't know how much the price would go up. There is no question there would be great strains put on that system. That is why I think a disruption tariff is something we ought to seriously consider. That is why I put it in my testimony.

Senator BRADLEY. Would there be an alternative to the financial system as such? I mean, wouldn't producers want to sometimes offer financing government to government? Is that an alternative in your view?

Mr. SAWHILL. Well, it seems to me that you have got to have an international financing system that permits payments to be made.

What would happen if you had a very rapid price increase would be that some countries which are heavily in debt would have a difficult time making their payments on schedule.

Senator BRADLEY. Right. And the question is, who do they get their financing from, Chase Manhattan Bank? Is it strong enough to provide that level of financing, not just that bank, but the whole private banking system? Or do they get it from the OPEC Development Bank? And, if so, who is thinking about the political strings that would be attached to such loans?

Mr. SAWHILL. Well, I think there are a whole combination of groups that they get it from. My own view is that it is better if it can come through multilateral financial institutions like the World Bank and the private financial system.

Senator BRADLEY. The World Bank is better than the private financial——

Mr. SAWHILL. No. I say the combination of the World Bank and the private financial system are better than producer-financed transactions which would carry political implications that you indicated.

Senator BRADLEY. Was this issue ever raised at the IEA?

Mr. BORRE. Yes. One of the other standing groups deals with producer-consumer relations. This is under discussion. I wanted to add one point on the producer financing of government-to-government transactions. There is the real possibility that ultimately the industrialized consumer pays. Now perhaps as a matter of general world economic equity that doesn't bother someone. But to the extent that preferential systems are devised as between OPEC and LDC's, you get the beginnings of a two-tier pricing system.

The possibility is there that the subsidy would be recovered in the pricing of the other tier.

Senator BRADLEY. Does that have political ramifications?

Mr. BORRE. It certainly does.

Senator BRADLEY. What are they?

Mr. BORRE. Well, first of all it is another degree of involvement as between a particular country and a particular oil producer that goes

beyond today's day-in, day-out relationship. Second, there is an economic implication for the consuming countries or upper-tiered price countries as a whole.

Senator BRADLEY. So that guarantees us higher inflation and lessening political clout in the Third World.

Mr. BORER. Those are two very plausible implications.

Senator BRADLEY. Thank you, Mr. Chairman.

Mr. CHAYES. Mr. Chairman, while we are on Senator Bradley's time, I hate to leave the hearing with him feeling that I haven't been candid with him.

Senator BRADLEY. With the committee. You are always candid with me, Mr. Chayes.

Mr. CHAYES. I did want to say that the point I was making is as far as I know, and I think I know this, there was no so-called Saudi Arabian veto over our decision. Obviously when you are making a decision of this kind you take into consideration the whole range of possible reactions by other countries as those reactions will impact the market. And so we do try to assess those reactions in order to make a sound decision.

Senator PERCY. Thank you very much. I think we can wind this up in about 15 minutes.

Mr. SAWHILL. Thank you, sir.

Senator PERCY. Before Senator Bradley leaves, I would like to say that when we had the Republican Convention, though I voted for the platform, there were three issues there that I took sharp exception to: the blood test for Federal judges on the abortion issue; the ERA and the lack of support for an amendment to the Constitution; and the 55-mile-per-hour speed limit.

Just throwing the speed limit back to the political discretion of the individual States, we know which States would immediately abolish it. We are having a tough enough time enforcing it anyway. I therefore was very gratified to see in yesterday's Chicago Sun Times the Marketing Institute of Public Opinion, the Gallup poll, an article telling how the American public strongly supports the 55-mile-per-hour limit. When I first put that bill in, we had cries of outrage from parts of my State where people have to drive a great deal, from Percy, Ill., in Randolph County, to East St. Louis.

Senator BRADLEY. Percy, Ill., just one example, right?

[Laughter.]

Senator PERCY. If every town in Illinois grows at the same rate, it will soon be the smallest in the country. It has come from 3,000 people in the 1900's to about 1,600 now. Outside of the general store, most of them work up in the St. Louis area, which is about a 55-mile drive. They didn't like the 55-mile-per-hour limit any more than many others did in many States. And I heard from a lot of them. But I really think it is symbolic of our energy problems. And I hope the American people will recognize it is far better for us to conserve and tax our own price up to what the rest of the world has been charging all of these years, rather than have us pay that out to OPEC countries. As for the 55-mile-per-hour limit, 77 percent of the Republican candidates' own supporters said the law should remain on the books. They solidly support it. And of the Democrats, 85 percent were for it. And of the independents, 78 percent showed solid support for it.

The reason they indicated that they supported the 55-mile-per-hour limit was that, first, a substantial reduction in fatalities had occurred. Second, the knowledge now that if we reimposed previous speed limits, it would cost us another quarter of a million barrels a day in oil. And we all know how vital that is and what effect that would have on our balance of payments, cost of materials we buy abroad, and so forth. And actually, people are pretty aware of the fact that if they drive more economically this helps them save in the family budget. So in time, the American public will back a policy that is right for the country. I just hope we take this out of the realm of politics now because it will cost votes if anyone tries to go out and advocate this, except in a few States. I think generally across the country we are appreciative of the fact we now have to adjust, and this is a very slight adjustment.

[At this point Senator Bradley withdrew from the hearing room.]

Senator PERCY. A few last questions.

Would a loss of Iranian and Iraqi oil take us up to the 20-percent trigger that would enable the President to implement the coupon rationing plan that has been approved by Congress? Could it get us up in that area?

Mr. SAWHILL. I don't think that is correct, Senator Percy.

Senator PERCY. Would it get you halfway?

Mr. SAWHILL. No. Very little of the oil from Iran and Iraq comes to the United States. I don't think that is correct.

Senator PERCY. Well, let's assume that some series of events brought us up to the 20-percent level and the plan was triggered. Right now DOE tells us it would take us 15 months to implement the plan. Suppose you could implement the rationing plan quickly, which I seriously doubt we could. I think it would take quite a bit of time. I understand DOE estimates a 20-percent impact in U.S. imports would lead to a $2 to $5 white market value to rationing coupons. Do we have any way of keeping OPEC from raising prices until the coupons are worthless?

Mr. SAWHILL. We certainly have no way to restrict OPEC price increases, as your chart indicates.

Senator PERCY. Doesn't this in a sense, then, make the plan really worthless, and there is nothing we can really do about it.

Mr. SAWHILL. Yes. We have been asked by the Congress to prepare a plan. We have prepared the plan, and we are going forward with implementation steps and have asked the Congress for appropriations so that we can proceed.

Senator PERCY. One reason that I fought the plan so much is my concern that we would feel that maybe we have done something. We've got a plan. We are going to be able to cope with an emergency. Do you share my concern that we really should not be in any way apathetic about this matter, that we still face a very serious situation and we ought to continue working on it?

Mr. SAWHILL. I couldn't agree more. That is why I feel it is important we have this emergency office, that we go ahead with the various measures we have talked about this morning, and just the fact we have a rationing plan should not make us complacent.

Senator PERCY. I have heard some say, Mr. Sawhill, that even if we lost the large amount of oil coming in from let's say Iran and Iraq, that the actual shortage would not really occur for 6 or 8 weeks because

of tankers at sea that are in transit. But isn't it true that pandemonium could strike the market for oil in the meantime and we would have gas lines in a hurry, because everyone reads the paper, sees these events, fills up gas tanks, and increases demand for heating oil? If we just filled every gasoline tank in the 153 million automobiles, we would have such an extraordinary demand imposed upon us that we would really have a very quick emergency facing us. Is that not correct?

Mr. SAWHILL. The situation certainly could result in price runup and other kinds of disruptions more quickly than the 6- to 8-week period you mentioned.

I think it is important there that we have a public information program that can make people aware of what the situation is and what we are doing about it so they will know what to expect, and we can avoid some of the hoarding we have experienced in past emergencies.

Senator PERCY. I wonder if in this public hearing you could discuss what DOE has done about the license plate plan that I have heard some reference to. I understand the plan under advisement now is a tougher version of the odd-even plan that you could implement under the EPAA. Is there any reason that that has not been subject to more open discussion, letting the public in on what some of the plans of DOE would be in that regard so they could be prepared for it?

Mr. SAWHILL. We are looking at a whole variety of ways to allocate a shortage. As I indicated to you, I prefer a market-oriented plan if at all possible because it seems to me that is the fairest way to allocate supplies in the event of a shortage. Other proposals have been suggested and we are reviewing them—a proposal, for example, that would restrict purchase of gasoline depending upon someone's license plate number; that would limit the amount of gasoline that could be purchased at any one time; proposals that would limit purchasing gasoline to a particular day in the week, the so-called sticker plan.

A variety of these are under study. We would be glad to make our analyses available to you. We expect a final rule on EECA title II, and a regulatory analysis, to be issued at the end of this year.

Senator PERCY. During the next shortage, the main burden may not fall on the gasoline allocation program in the Office of Hearings and Appeals, but on the EECA plan of the State emergency conservation plan.

I understand these plans could take many months to implement. Would this EECA program actually work, in your judgment, Dr. Sawhill, during an emergency? Why are so few States moving quickly to develop their plans?

Mr. SAWHILL. Well, I cannot tell you why the States are moving, some States are moving more quickly than others, but I would reiterate that I think the best thing we can do in the event of a supply disruption is to use market mechanisms rather than regulatory mechanisms.

Senator PERCY. Just a few remaining questions on the Iran-Iraq situation which could lead to possibly a serious supply interruption in a few weeks. If we gave the matter absolutely top priority, do you think we could weatherize many homes before winter? Do you think we could prevent much hardship in this way? I think we could. Every time we have some sort of a critical situation, we have a good oppor-

tunity for us to move ahead and say, "Look, we have got to respond." It is hard inbetween times to get people excited.

Mr. SAWHILL. A weatherization program is very important. In the Energy Security Act, which you passed, there is a provision for significant amounts of money through the Solar and Conservation Bank to be made available for weatherization. Beyond that, there are a number of other weatherization programs and retrofit programs within the Department, some at the instigation of Senator Bradley, as we mentioned earlier. I would be in favor of anything we could do to accelerate the retrofit of our homes to make them more energy efficient.

Senator PERCY. It is my understanding that little or no work is underway at DOE to develop a standby plan for a massive emergency weatherization program of this kind, however. Do you think, Dr. Sawhill, this is wise, or could you tell us what the state of it is?

Mr. SAWHILL. I don't think this is as much an emergency program as it is a program that should be accelerated because it reduces our dependence on foreign oil. So I regard it not so much as an emergency measure, but as a long-term, ongoing program that we should make the maximum effort to achieve.

Senator PERCY. Could we establish—would it be wise to establish, just as we have in the filling of the strategic reserves, a goal and set this out as a program that should and must be achieved?

Mr. SAWHILL. I couldn't agree more.

Senator PERCY. Again, my whole purpose is mainly to try to raise the priority of these programs and assure DOE that they will have widespread support here. We will help you in any way we can to get these programs underway.

Mr. SAWHILL. We took the advice of Senator Bradley to conduct a number of demonstrations of weatherization, and based on our analyses of those demonstrations, to come back with a recommendation for a full-scale program, and we are moving ahead on that. We just received that authority to move ahead on these demonstrations with the passage of the Energy Security Act.

Senator PERCY. Have you ever considered asking the Solar Energy Research Institute, your own national laboratories, and your own staff to start looking into applications of the weatherization program, conventional energy technologies, fuel switching programs, renewable energy sources?

In the light of present circumstances, would it warrant that kind of extra attention?

Mr. SAWHILL. Well, I will put it this way: We are currently considering asking the Solar Energy Research Institute to prepare such an assessment and we would be glad to share such an assessment with you and your committee when it becomes available.

Senator PERCY. I doubt that OPEC would ever want us to kick the oil habit. But, on the other hand, in my discussions with virtually every OPEC country, except Libya, I have——

[Laughter.]

Senator PERCY [continuing]. Heard considerably from them that they really are supportive of all of our efforts. So many of them have used the same phrase, that oil is worth a lot more to us in the ground.

The longer it stays there, the higher the price we are going to get for it, and the longer we can delay the kind of a program we are going to have to have to make up for the loss of oil revenue we will have when it is finally depleted.

If the United States could demonstrate to OPEC and the rest of the world that one more crisis might cause us to get our act together and move rapidly toward energy self-sufficiency, do you think that might deter them from using the oil weapon against us in a serious way? If they really saw we had a program underway, that we were moving in the direction of lessening our dependence on imported oil and lessening our dependence on them, do you think at least it would discourage using the oil weapon, so to speak, and that it might prevent or at least discourage continued, steady increases in imported crude oil prices?

Mr. SAWHILL. Well, I can't say what the impact on OPEC would be but I think it is very important for us to make every effort to reduce our dependence on foreign oil.

Senator PERCY. Senator Cohen had indicated that he wanted to attend this hearing and Senator Roth, both of them, have not been able to be here.

I would like to make a closing statement and then, of course, the record will be kept open for any comments of our colleagues who were not able to be here on this Monday morning.

Before I begin my closing statement, however, I would like to comment briefly on the role of renewable energy resources including alcohol fuels and other types of biomass in helping us out of further supply emergencies.

I have been somewhat disappointed by the administration's lack of clear direction in the area of solar and renewable energy. An example of this lack of direction can be found in the difficulties that plagued the administration of the Solar Energy Research Institute and the regional solar energy centers into the Federal solar effort.

Along with Senator Ribicoff, I requested the GAO to carry out an investigation of this problem. The results are currently being released in the form of an excellent report that outlines a number of steps for improving the contributions to the Solar Energy Research Institute and regional centers. I urge the Department of Energy to carefully consider each of these suggestions. In light of the capabilities of the people in the Solar Energy Research Institute, national laboratories, and DOE's own staff, I wondered if you have considered requesting a study of the potential emergency application of the renewable energy resources and energy conservation efforts.

Such an investigation might be undertaken as part of a larger effort that would also look into the emergency potentials of fuel switching and enhancing energy supplies and conventional energy technologies. Do you think it might be a good idea?

Mr. SAWHILL. It certainly is worth looking into.

Senator PERCY. And any reply that you would like to make for the record in greater detail certainly we would appreciate having.

We have not called upon some of your colleagues for questions. You have covered almost all of them. If any of them would like to make a brief comment, we would be very happy to have you do so.

Mr. House, do you have anything that you want to add?

Mr. Linden?

Mr. Newkirk?

Peter Borre? You have been very helpful today.

Dr. Sawhill, I do want to thank you and your colleagues for being with us today. We appreciate it very, very much.

Dr. Sawhill, I would like to thank you once again for coming to this hearing and offering such excellent testimony. I appreciate the candor with which you have answered our questions. I am also grateful for the fine cooperation which Bart House, Bill Taylor, and other DOE officials have given the subcommittee staff. I hope we can continue working together in this way as we try to improve our Nation's energy preparedness.

I can't say I am totally reassured by this hearing that we are full and adequately prepared for what might transpire. The purpose of this hearing was to focus on that, and we have been very candid about some of the problems that we face and the lack of answers we have to some of those problems. I hope it will give us incentive to drive forward under your successor and Charles Duncan, to drive forward to find answers to the problems that we do face.

A few months from now, I would like to hold separate hearings on the two aspects of this problem that most concern me: how we might restrain the runup in the price of crude oil during a supply disruption, and the steps we could take to produce and conserve our way out of such a crisis in the shortest possible period of time.

In the meantime, I very much appreciate your asking Secretary Duncan to give an extra measure of his own personal attention to emergency preparedness and to make it not just a high priority but a very top priority in the Department.

I think the country really needs that assurance and certainly many Members of Congress feel that it ought to be a very, very high priority.

In particular, please ask Secretary Duncan to take the following actions, if you would. I will give you a copy of these.

We very much would appreciate, and I would like the Government to press for an international agreement, supplementing the existing IEA program, which could help restrain crude prices in time of crisis. I would also like DOE to start evaluating actions which the United States could take unilaterally, if need be.

Second: I would like to see major studies launched as soon as possible to review the potential for all presently available energy conservation and production technologies in time of crisis. To accomplish this, I encourage DOE to use the Solar Energy Research Institute, your national laboratories, and the other fine sources of technical expertise that it has immediately available.

Third: Pursuant to all the issues we discussed today, I would like DOE to develop an explicit plan describing the steps which the President could take in the first 90 days of a severe supply disruption.

Finally: For as long as you remain Deputy Secretary, I urge you to assume personal responsibility for upgrading our Nation's preparedness for a supply disruption, and I urge Secretary Duncan to have your successor do the same.

I will submit these questions to the Energy Committee to be asked of your successor in his confirmation hearings, and I would like this to be advance notice, because those will come presumably before the followup hearings that we would hold.

I have asked the subcommittee staff to work closely with DOE as you proceed on all these items, and I would like to receive a progress report from Secretary Duncan by the end of this calendar year.

I am confident that a lot can be done between now and then if this matter is given the attention it deserves. I do not exaggerate when I say that our Nation's economic and even military security may hinge on what DOE does or does not do in the short time we may have left before our next supply disruption.

I discussed this matter at a luncheon last week with the Foreign Minister of Japan. They are in a far more vulnerable position than we are, even, but I think it is a matter of grave concern to them and it should be a matter of grave concern to us.

The free world can't stand the kind of a disruption we might have, and our dependence now on imported oil makes this country very, very vulnerable. I despair for our ability to cope with the problems of inflation and declining productivity on the one hand and increasing dependence on imported oil on the other. From a dollar standpoint, even if we cut consumption, the dollars we expect to pay out continue to go up.

I wish to thank you again for addressing yourselves to this problem. I think it is one of the most urgent problems the Nation faces.

Again, I commend you, and your board of trustees at New York University, on the work that you have done in DOE. Their loss has been our gain. We deeply appreciate their willingness to let you leave the campus to come down and cope with this problem which you are absolutely uniquely qualified to carry out.

I am very, very pleased indeed that you have seen fit to become chief executive officer of one of the largest and most important corporations we are going to have in this country, and I assure you of my full support in that regard.

Mr. SAWHILL. Thank you very much, Senator.

Senator PERCY. The hearings are adjourned.

[Whereupon, at 12:45 p.m., the subcommittee was recessed to reconvene subject to the call of the Chair.]

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